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NO. 1

ORIGINAL COMMUNICATIONS.

SOME FACTORS IN OPERATIVE TECHNIC AND MANAGEMENT WHICH MAKE FOR SUCCESS OR FAILURE.¹

BY

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My paper is fragmentary. From necessity it must be so. In the multiplicity of what I would like to say, much is perforce left unsaid. It is hoped its usefulness will appear as much in its suggestiveness as in its positive statements.

As a preliminary to all operations, and this is of universal application, there must be some effort made to determine the resistance of the individual patient, save in case where the operation is imperative, not selective.

Briefly, 1. Ascertain with accuracy any variation from a normal standard of health—functional or organic—such information will go far in determining for or against operative interference. This includes a precise knowledge of any involvement due to concomitant disease apart from the surgical condition for which operation is proposed.

Too often co-existing disease of the circulatory, respiratory, renal, hepatic or digestive organs is overlooked, and the patient subjected to unwarranted risk of operative procedure without any qualifying influence their presence might suggest.

2. That inherited longevity,—other things being equal,—exerts a most salutary influence on the chance of recovery after surgical interference, cannot be gainsayed.

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

The perfect balance of health, seen in individuals and families, oftentimes coincident with splendid physique, but with a short lived ancestry, die when that "perfect balance" is disturbed from comparatively mild attacks of sickness, or fail to rally after major operations, or accidental injuries.

These facts have due weight in deciding for or against an operation. Without such scrutiny, a high rate of mortality, and avoidable disappointment, too often follows. Seek out with scrupulous care the former history of the patient in previous illness or accident. If, after severe acute disease, recovery follows with little or no impairment of vitality, or when the patient has had a satisfactory convalescence from serious injury or grave operation, it adds much to the chances of a successful issue, which, without such assurance, might or perhaps should not be undertaken.

3. The surroundings of the patient must be carefully studied. If hygienic and salutary, it may warrant interference; if otherwise, and added to it the physical status is not good, the operator will carefully weight all the reasons pro and con, before determining. Too often there is lack of endeavor to build up the general health of the patient, as after-results prove.

4. Too many operators (may be specialists from the date of graduation) having little or no knowledge of general medicine, or skill as diagnosticians, fall into grievous difficulties. In this category are the men who operate for appendicitis in typhoid fever, for supposed intestinal obstruction in fecal impaction, and confound cholecystitis for cholelithiasis. They lack the discriminating power which is the outcome of years of observation and experience, which fits them for their responsibilities.

5. The emotional nature cannot be ignored. The influence of hope and fear, the most powerful motives in the human heart, must be reckoned with. In every-day life, these emotions make alive or kill. No less potential are they in the domain of surgical experience—not in every individual case—but in those borderline cases in which the minute—as well as the larger factors of success or failure enter—must be thought out and balanced in the final estimates. In desperate straits the operator goes to his task with courage when the patient is courageous, or in trepidation when the patient is demoralized. Here is the domain for the tactful operator. Experience has taught me a little—would that it had been more. The entire confidence of the patient must be had if attainable. It is not enough that she has

sought your advice. It may be easy to convince the patient of her condition, and the need of operation, but that is not enough. You are told she would have it done, except for the want of courage. Tell her not to wait for that. If you commanded her confidence sufficient to seek your advice, tell her to take one step farther, trust you for the results. Stop worrying, and it will be a surprise how often a suggestion will be accepted, and the confidence of the patient restored.

In proportion as you have suggestive power to influence such persons, and confirm their courage, count yourself not only wise, but fortunate. Not a few patients have found this reassuring suggestiveness a precious shelter, which turns into a bulwark of safety. Never keep your patient in avoidable or needless suspense. It may prove a dangerous experiment. We all appreciate the baleful influence of fear as shown in its demoralizing influence. It is a safe rule to delay in informing an apprehensive timid patient, until the time for the operation is just at hand. The dread or anxiety attending the outcome of an operation should be as far as possible eliminated. A sleepless night in grave conditions might change the outcome of the operation. Operate on those cases early in the morning, when the patient's power of resistance is at its best. It is not suggested, neither is it to be implied, that the inspiration of hope changes the gravity of the situation *per se*, but that it is possible in these border-land cases, in which we are forced to ponder well the question whether the patient "shall bear the ills she has or fly to others she knows not of," in the belief strengthened by experience that the determined hope and optimistic spirit has marked the difference between failure and success.

6. The evil of procrastination on the part of the operator when the plainest evidence demands immediate operation is a matter of profound regret not only, but unfortunately it is open to severe criticism. The sins of omission, in not operating in spite of the plainest indications, and that of commission, in operating for supposed conditions not present, which was previously referred to, cover a multitude of professional sins, the influence of which reacts upon the public mind, lowering their confidence in professional skill and judgment. Too many surgeons follow a rule of Aaron Burr, viz., "Never do to-day what you can put off until tomorrow, for when tomorrow comes it may not be necessary to do it." In numberless instances it makes impossible doing to-day what *should* have been done yesterday.

In scanning the horoscope of your patient, look not for the present alone, but for the future. Ponder well if operation is a matter of choice or necessity, and from this vantage ground determine your policy. Unless time is the most important factor, never operate until the patient is placed in the *best possible condition*, physically and mentally for the ordeal. It may be a problem of days, months or years, to put her in such condition, but take your time. Let sound judgment and duty as well as expediency have their legitimate sway.

7. Anesthesia. The well recognized rules regarding the selection of an anesthetic in a given case is too well known to require more than passing notice. Save in obstetric practice, the greater safety of ether is usually recognized. That ether may be advantageously modified by nitrous oxide gas is well established. But it is of superlative importance that there should be skill in its administration. In too many hospitals the administration is left to last appointed interne, without reference to his knowledge or capacity. To know how to give an anesthetic, and no more than is required, is indeed a high attainment. The evenness of its administration, so that physical quiet ensues without excitement or depression, is of the first importance to the patient and operator. There are masters of this art—names I might mention—whose part in the operation is only second to that of the operator himself. The freedom from struggle, the absence of hypernarcosis and undue lividity, the normal color of escaping blood, the general composure of the patient, relieves the operator from solicitude, and enables him to concentrate his efforts to a single end. It is amazing how little some practitioners of much observation appreciate the toxic influence of anesthesia, and the shock it induces. It is a matter of surprise how much ether some anesthetists will give in an operation, and how little others will use in the same period of time. One will empty several cans of ether, another fewer ounces. Comment is unnecessary as to the advantages of the latter. No rule will apply to every case. Skill and experience must decide. If the mortality arising from avoidable toxicity of anesthesia and prolonged shock was known and eliminated, there would result a diminished mortality for causes not well understood and erroneously recorded.

The responsibility too often rests farther back, a deficiency in teaching in the schools. If not yet already come, the time is near when proper preparation of the anesthetist must and will command the hearty co-operation of all medical colleges and

teaching faculties. Not to do it, will expose the faculty to just censure. Usually the greater the skill of the anesthetist, the shorter the period required for surgical procedure. A truly skilled anesthetist rarely requires more than four or five minutes, for the production of full anesthesia.

No matter who the operator or where his work is done, those intrusted to the administration of the anesthetic should be the best, and not those least qualified for so important work.

Greater appreciation of these truths are bearing fruit in this great metropolitan center. Within the area of Greater New York are a corps of expert anesthetists—some who devote themselves exclusively to this work, whose presence in the operating-room relieves the operator from a distracting obligation, and facilitates that concentration of thought, so needful to rapid and thorough work not only, but contributes in large degree to the success of the operation. The time is not far distant when this subject will seek and receive the attention it demands.

8. The time taken for an operation, and the preparation for it, is the greatest moment. The period required by so-called good operators varies, and so does their goodness. One man will take sixty minutes to perform an operation, which another will do equally well in twenty to thirty. So far as skill and exactness in technic are concerned, they may be on a perfect equality—what about the patient's chances? The occasional operator whose patient usually survive the operation is satisfied if no catastrophe happens, and goes home justified, no matter if his operation is measured by half an hour or a multiple of it. Some man will come along with the statement that in robust patients in minor or even major operations, the time element is not important, but will his mental attitude enable him to discover the dangerous factors which affect the ~~circulation~~ circulation, the respiration, the complicated functions of the nervous system in patients less robust or whose resistance is of a subnormal character? This state of mind is in itself a handicap to its possessor and a menace to his patient. If he knows it not, his misfortune is great, not so great as those who have surrendered to him their confidence, perhaps their safety. If the specific inquiry is made, how much time an operation should take, this would be my answer; no longer than is needful for its accomplishment consistent with thoroughness. This contemplates the most rapid work possible. It assumes that the preparation of the patient is attended to in advance, and the toilet of the operator assistants quite completed. It implies

that all instruments and accessories, which emergency might require, are in a state of readiness, so there shall not be a moment of delay when the anesthetist is ready.

Just here, too often, is the loophole for culpable delay, not a deliberate purpose to minimize the chances of the patient, but lack of keen sense of obligation, to leave nothing undone which shall detract from the success of the operation. A few weeks since in one of our metropolitan hospitals, a surgeon of ability, with a large following, when urged to hasten the operation by the physician who had furnished the case, declared there was no reason for haste, etc., was told in plain terms he would never send the operator another case, and would advise his friends accordingly.

It is time the dilatory operator mended his ways—failing to do so, he will find, some day, he has unwittingly impaired the confidence his professional brethren had reposed in him, which the public is often quick to discern.

1050 PARK PLACE.

A REVIEW OF THE HISTORY OF THE IODINE METHODS OF SKIN STERILIZATION.¹

WITH REMARKS ON THE TECHNIC OF ITS USE.

BY

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SHORTLY after the appearance of Senn's article on "Iodine in Surgery, Gynecology and Obstetrics," I was impressed with the great advantage of iodine as a comparatively non-toxic antiseptic agent and began using an iodine solution in the preparation of the skin for operation. I also used it for the hands in such cases in which gloves were not worn. The results were eminently satisfactory in a large number of cases and I called attention to the use of iodine for this purpose in an article published in the *Journal of the American Medical Association*, April 14, 1906. This article was entitled, "Some of the Uses of Iodine in Surgical Practice." I quote from it as follows: "I have found the tincture of iodine to be a simple, readily obtainable and effective agent for the preparation of a small patch of skin preliminary to the insertion of the needle of the hypodermic or of the antitoxin syringe. For a year past I have been using a 0.5 of 1 per cent.

¹Read before the twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September, 26-28, 1911.

iodine solution for purposes of hand disinfection in all cases in which rubber gloves were not worn. As a routine practice I wear gloves in operative work. In a certain class of cases gloves are undesirable. Again, a glove may be punctured or torn in a septic case, and the surgeon will feel the need of a reliable antiseptic, both for the protection of himself and his future patients. The use of this solution is simple and time-saving. The technic I practice is as follows: Thorough scrubbing with nail brush, green soap and running hot water. Cleanse the hands in a systematic manner. Take each part in a certain order every time, so as not to skip any part. Pay particular attention to the nail folds, subungual spaces and the skin between the fingers. Clean under short-clipped nails with a heavy metal nail file. Scrub again, wash off soap in running hot water, remove residue of soap by immersion in 70 per cent. alcohol. Immerse in iodine solution for five minutes, rinse in sterile water or let the solution dry on the hands. The light brown stain can be removed by washing in diluted ammonia water after the operation is over, or if left alone will soon disappear.

In the preparation of the site of incision I invariably observe the following routine: The evening prior to operation the area is covered by a green soap poultice, which is allowed to remain for several hours to loosen the dead and scaling epithelium; the part is shaved, going wide of any possible incision, then carefully cleansed by the use of a soft nail brush or gauze pad, liquid antiseptic soap and sterile water followed by alcohol. After this a compress wet with 1-5000 bichloride is applied, covered with oiled silk or other protective and secured by a bandage. This is undisturbed until the next day after the patient is under the anesthetic, when the compress is removed and the part is treated to a second cleansing with antiseptic soap, gauze pad and sterile water, followed by diluted alcohol; the solution of iodine is then applied and allowed to dry on the skin. Naturally in emergency cases much of the treatment preliminary to the use of the iodine solution will have to be omitted.

The solution of iodine used for the hands may be made up with dilute alcohol or prepared according to the following formula: Iodine 2.5 gm., potassium or sodium iodide 5.5 gm., water 250 c.c. This gives a 1-1000 solution, which can readily be diluted to the desired strength. In a long series of cases in which the iodine solution has been used as described, the results from a clinical point of view have been excellent, and it is easy to conclude that

as a chemical agent for at least the partial sterilization of the skin iodine is the most satisfactory substance we possess.

It must not be forgotten that this, the most harmless of antiseptics and its compound iodoform are active agents, and as such should be used carefully. Under certain conditions they are very toxic. The pyogenic membrane lining an abscess cavity seems to be practically immune. Patients suffering from septic infection will tolerate more than the usual amounts administered. The feeble and aged are often susceptible. Iodoform irritation on the exterior of the body usually takes the shape of a severe dermatitis, not any worse, however, in character than that occasionally produced by the use of a bichlorid, compress on a sensitive skin.

My conclusions are that iodine is the antiseptic par excellence for the skin of the hands and operation site. The solution of iodine is easily prepared and is stable. It does not coagulate albumin or form inert compounds with the tissues. It is of more value in many ways than either carbolic acid or bichlorid of mercury and not nearly so poisonous.

Later, I wrote a paper entitled "Aseptic Operative Technic," for the Hot Springs Meeting of the Mississippi Valley Medical Association, held November 8, 1906. This article was published in the therapeutic Gazette, May 15, 1907. From it I quote the following: Prior to major operative procedure of any sort I prefer to give the patient a few days at least of preliminary treatment, including a carefully regulated diet, purgatives, and rest in bed. The intestinal tract is in a measure freed of excretory products, intestinal indigestion with its putrefactive and gas-forming concomitants is temporarily held in abeyance and the individual who may be accustomed to the most active habits becomes habituated to life abed. As the eliminative power of the skin when in a normal state of efficiency is great, considerable attention should be given daily for several days, a clean suit of underclothing being put on after each bath. Eczematous conditions of the skin as a rule should be a bar to light or liquid diet the day before operation, no food of any sort the day of the operation unless the patient's vitality is below par, when some form of liquid nourishment is administered to within two or three hours of the anesthetic time. All other factors being equal, the smallest amount of food and feces we have in the gastrointestinal tract at this time the better for the patient. As I usually begin operating about 2:30 P. M., the patient has by

that time had ample opportunity to get results from the routine of fasting and the administration of purgatives.

The evening of the day before operation a soap poultice is applied to the operation site and vicinity; this remains for two or three hours, when the part is carefully shaved, then washed with liquid antiseptic soap and warm water, followed by alcohol to remove the residue of soap. During the cleansing process care is taken not to produce abrasions, a soft brush or preferably a gauze pad being used to scrub the skin. In this preliminary skin cleansing a careful aseptic technic should be maintained. A sterile gauze dressing is applied and retained in place by a bandage. As containers for the solutions used in cleansing the skin site; glass flasks of appropriate size having well-fitting rubber stoppers with bent glass tubing are used. This insures a small, steady stream that can be stopped or started at the right time and directed to the desired spot.

A purgative of some sort is given the evening of the preparation and a saline early the next morning. This is followed in two hours by a soap-suds enema if necessary, and later by saline enemas until they return clear. The bichloride compress is not used for the reason that it macerates the epithelium and diminishes the regenerative powers of the skin. The dry dressing is as a rule undisturbed until after the anesthetic has been started, when the final cleansing of the skin is done. Precisely the same technic is observed as in the preliminary cleansing with the addition of a 1 per cent. solution of iodine, which follows the alcohol and is allowed to dry on the skin. The patient is covered by a sterile fenestrated sheet; the operation area is outlined by sterile towels and loosely covered until the operation is begun. It is an easy matter to overdo in our attempts at asepsis. Overzealous scrubbing, too much energy expended in this direction, will defeat the end aimed at. Naturally in emergency cases the preliminary cleansing will have to be omitted. The solution of iodine may be made up with dilute alcohol or in accordance with the appended formula: Iodine, 2.5 gm.; potassium or sodium iodide, 5.5 gm.; water, 250 c.c. This gives a 1-100 solution, which can readily be diluted to any desired strength by the addition of water.

Granted that the attainment of absolute asepsis of the skin is about as impossible as squaring the circle, it yet behooves us to try to reduce the bacteria to the smallest possible number to each square inch of surface. In the preparation of the operation site

one needs to have an intelligent appreciation of the possibilities of skin affection and the consequences of the same. As the complete sterilization of the skin with our present crudeness and limitations of science is a futile impossibility, we have to make the best use of the opportunities at hand. The value of the iodine solution as a germicidal agent for streptococci and staphylococci has been bacteriologically proven beyond a doubt; clinically this method has been productive of the happiest sort of results, and it is easy to conclude that as a chemical agent for at least the partial sterilization of the skin iodine is the most satisfactory substance we at present possess.

For purposes of mere mechanical cleansing of many of the mucous membranes of the body prior to operation I have the parts copiously flushed with physiologic saline solution. Urinary antiseptics are used to improve the sanitary condition of the vagina and uterus. The cleansing of the vagina is a subject often neglected; a careless sort of douche is given, and the part is said to be clean. Every part of the vaginal wall should be carefully cleansed with liquid antiseptic soap, hot water, and a thorough scrubbing with a gauze pad. Especial attention should be paid to the space just behind the cervix, where discharges are prone to accumulate and entirely escape the average douche. Alcohol causes too much burning for use on the mucous membrane even of the vagina. The soap should be removed by free use of warm water; thereafter, the dilute iodine solution should follow.

In conclusion, I said that bichloride of mercury as ordinarily employed is useless and engenders a false sense of security.

That the bugaboos of prolonged scrubbing of hands and arms with rough brushes and the reckless use of strong bichloride solutions favor rather than diminish the chances of infection in the long run.

That the iodine solution is comparatively nontoxic and highly antiseptic. Laboratory experiments have conclusively proved that as a germicide a 1-500 solution of iodine will do in five minutes what it takes a 1-1000 solution of bichloric half an hour to accomplish.

In November, 1906, I published a paper in *American Medicine*, entitled, "Iodine and Some of its Uses in Surgical Work." I quote in part: Roux first made use of tincture of iodine in hand disinfection, using it for the finger-tips to penetrate the subungual spaces and the nail folds. von Mikulicz used it in the same

way and Senn uses it for that purpose, introducing it around these crevices with a nail brush. For several months past I have used a one-half of 1 per cent. alcohol solution for purposes of hand disinfection preliminary to operative work in all cases in which rubber gloves were not worn. The same solution is made use of in the preparation of the site of the operation incision. I wear rubber gloves as a routine measure in operative work but in a certain number of these cases gloves are undesirable, again in an occasional septic case, a glove may be punctured or torn and the operator feels the need of some reliable antiseptic for his own sake as well as for the protection of his future patients. The use of this solution simplifies the technic and saves time. First thorough scrubbing with nail brush, green soap, and running hot water, going over the hands in a systematic and methodic manner, taking each part in its turn, and always following the same order so as to skip no part. I pay particular attention to the nail folds, subungual spaces, and the skin between the fingers. Short clipped nails should be cleaned with a good heavy metal nail file, the hands scrubbed again, washing off the soap in running hot water. Remove the residue of the soap with 70 per cent. solution of alcohol, immerse in iodine solution for five minutes, rinse in sterile water. The light brown stain can be removed by washing in dilute ammonia water after operations, or if left alone it will soon disappear.

The results clinically of this method have been superb. In a long series of cases no infection attributed to the hands has occurred.

In conclusion I would say that iodine constitutes a near approach to a perfect antiseptic in that it is nontoxic in effective strength, being one-fourth as poisonous as mercuric chloride though many times more valuable as a germicide. It does not coagulate albumin or form inert compounds with the tissues. It possesses great penetrating powers, is easily prepared, and is stable.

A solution of iodine is the most practical chemical agent we have for the sterilization of the skin. In a paper entitled the "Conservative Surgery of Arms and Legs," published in the *Journal of the American Medical Association*, May 11, 1909, by myself, I said: "Scrub from, not toward the wound, be careful not to allow soap, water or other solutions to run into the wound while the limb is being cleansed. Turpentine, gasoline, benzine or soap and water followed by alcohol or ether are all effective and

their varying use is only a matter of choice. Lastly I apply to the limb 0.5 per cent. iodine solution. I irrigate the wound thoroughly with hot normal salt solution."

I have discontinued the use of peroxide of hydrogen and have never used a bichloride of mercury solution in the irrigation of wounds. I am satisfied that both promote rather than decrease wound secretion. Warm normal salt solution is a good mechanical cleanser and is nonirritating to the tissues. A weak solution of iodine is possessed of a maximum bactericidal power combined with a minimum toxic and irritant effect. It not only has a destructive effect on pus germs, but to a great extent will seal the ends of the lymphatic and blood-vessels against the absorption of septic material."

In the fall of 1907 I visited Munich and at the clinic of Doderlein, who succeeded von Winkel, I saw that iodine was being used. I mentioned it in my letters to the *West Virginia Medical Journal*. These letters were published in installments and this part was not published in the journal until June, 1908. I quote in part: In the preparation before the operation, full strength tincture of iodine on the skin a short time previous to incision. This is followed by a semi-liquid mixture containing rubber, carefully spread on the skin by means of a roller after which a small electrically driven fan is held near to facilitate drying.

So far as I know I was the first to make use of iodine solution as a routine in the preparation of the operation site, having used it continuously since early in the year 1905. At first I followed soap, water and alcohol with bichloride. Either the skin was cleansed thoroughly the evening before operation, with soap and hot water, gauze and sponge, then again alcohol, then a dry dressing was applied. After the anesthetic was begun, the skin was gone over with pure grain alcohol, and followed by the iodine solution. I had charge of a large charity clinic at the Sheltering Arms Hospital and made use of iodine in all my cases.

Last year I began a fractional method by giving the skin several successive paintings when dry with iodine solution.

As chairman of a committee appointed for the purpose of securing uniformity in the operating room technic of the Charleston General Hospital, I compiled a series of rules for the operating nurses, and these were published in the *West Virginia Medical Journal*, January, 1911. To summarize part of these rules, I will say that physical cleanliness of the part proposed for surgical attack, is secured by the plentiful use of razor, soap, gauze or cot-

ton sponge, hot sterile water followed by alcohol. Afterward the iodine solution is applied, as soon as the skin is dry. Early next morning the skin is repainted and after the anesthetic is begun there is a final painting of the skin with iodine solution. We have been using a 10 per cent. solution of the tincture in alcohol in elective cases. In emergency where only one application can be made, the full strength tincture is used. I have infrequently seen a fine vesicular eruption of the skin follow the use of iodine as a disinfectant.

COYLE BUILDING.

SIGNIFICANCE OF DELAYED OPERATION IN TREATMENT OF ECTOPIC GESTATION.¹

BY

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HEMORRHAGE and sepsis are the Cardinal dangers of Ectopic gestation. Sepsis is never a primary trouble. Its activity is engrafted upon a pre-existing hemorrhage, which is the result of a ruptured gestation sac. Sepsis is secondary, hemorrhage primary. In order safely to combat them, it is necessary to remove the underlying cause. To prevent sepsis is to prevent hemorrhage. In order that no hemorrhage shall exist, it is necessary to remove the gestation sac before rupture. When hemorrhage is evident, the only dependable means to secure control is to ligate the vessel approximate to the bleeding orifice. That sepsis with the complications which it produces may be avoided removal of the bacterially fertile blood clot and the gestation debris is imperative. When infection is engrafted upon the hemorrhagic remains the septic material must be removed and means established for the further drainage of the products resulting from the septic process. The treatment of ectopic gestation therefore, is essentially surgical.

SELECTION OF TIME FOR OPERATION.

In the treatment of any disease the cure of which is dependable upon surgical action, the prudently selected time of action must be based on individual experience; the influence of apparently logical arguments of others; or the feasible demonstrations

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

offered by co-workers. When to operate for the removal of an unruptured extrauterine pregnancy the diagnosis of which has been fully established, seems a well-settled question. The removal of an unruptured sac in itself is so simple; the risk to maternal life so slight; the certainty of protection against subsequent serious dangers which the gestation process threatens is so reassuring, there is no justification for an opinion dissenting from prompt surgical intervention. Most frequently, however, rupture has already taken place before a recognition of the trouble is established. Consequently it is the condition at the time bleeding is active from the rupture, or the condition resulting from the hemorrhage, with which the surgeon has to deal. To immediately operate or to delay operation at this stage, invites consideration in which there is some difference of opinion. "There can be no doubt that an immediate abdominal section is the only proper thing to do—" was the dictum expressed by an eminent member of this association at a regular meeting as long ago as 1888. In this opinion the members evidently concurred. This teaching has gone forth and has widely influenced action for the saving of women unfortunate in being afflicted with this malady. This dictum was supported by the apparently logical conviction that a bleeding vessel required ligation, that the earlier the ligation be done the less would be the jeopardy from loss of blood. Even at that date when aseptic surgery was not established, the practice of immediately operating was convincingly judicious in the minds of those studying the greater safety for ectopic victims. It is difficult to comprehend that with the additional advantages gained for surgery by the subsequent perfection of aseptic technic, immediate operation for this cause should be less in favor.

More recently, however, advocates of delayed operation have been in evidence. That hemorrhage from a ruptured ectopic gestation is self checking is by these gentlemen assumed. This assumption is based upon what purports to be analogous study of self-limiting hemorrhage occurring in other parts of the body, together with evidence deduced from experimental investigation upon the dog. It is opinioned that it is not hemorrhage, but the shock that threatens calamity; that the phenomena of shock is a cause unto itself and not necessarily a result of the bleeding. By these deductions it is argued that it is wiser and safer to wait until recovery from shock has taken place, rather than to add additional shock by surgical trauma in operating to control the

bleeding. It is inferentially assumed that by delaying operation life would not be jeopardized, but conserved; that the operation will be with less risk to life, and secure an easier convalescence. If reasons encourage these contentions, if experience support their assumed merit, and if observation of facts convinces us that these contentions are sound, then they deserve our adherence. My convictions are that these contentions are dangerous—dangerous not only inasmuch that they may influence the surgeon, but more so in that the general practitioner, by whom ectopic sufferers are first observed, is encouraged by such teaching to be less careful of diagnosis and to procrastinate action beyond safety.

Although one's experience may be limited, experience is the medium through which comes his strongest convictions. The following series of cases influence me:

BRIEF ANALYSIS OF CASES.

That hemorrhage from a ruptured ectopic gestation endangers life was fixedly impressed upon my mind by the first case that I observed and it illustrates the fallacy that the hemorrhage can be depended upon to check itself. Sudden pain seized the victim while at church. She was carried at once to her home a half block away, where I saw her in my brother's stead within thirty minutes from time of initial pain. She had a rapid pulse; possessed pallor of features, and suffered intense pain in the abdomen. I did not make a proper diagnosis. To secure quiet and ease was the object aimed at. Morphia was given and recumbent rest enforced. My brother directed the subsequent care of the case which consisted of absolute recumbent rest, functional quiet secured by repeatedly giving morphia, and the required stimulation. The unfortunate woman grew progressively worse, exhibiting air hunger with other evidences of hemorrhage, and perished thirty hours after her initial symptom. The post-mortem revealed the lower abdomen full of clotted blood, ruptured right Fallopian tube, and a six to eight weeks fetus surrounded by the clotted blood.

Six cases reported in second division of this series were in an alarming condition when I first saw them. Two of which (cases 21 and 24) had not rallied from the primary shock and I operated upon them ten and eight hours respectively after rupture; at which time instead of their condition having grown better,

Case	Time elapse after first hemorrhage until operation	Physician	Recurrent	Condition previous	Condition subsequent	Operation
FIRST DIVISION.—ONE CASE.						
1	36 hr.	P. M.	Continued.	Primarily bad	Increasingly worse	None.
SECOND DIVISION.—SIX CASES.						
2	2½ days	A. W. B.	3	Primary not bad	Each recurrent worse.	Extremely bad.
7	2 hours	M. S. L.	3	Primary not bad	Each recurrent worse.	Extremely bad.
17	3 days	E. H.	3	Primary very slight.	Each recurrent worse.	Extremely bad.
19	5 hours	E. G.	2	Primary very slight.	Each recurrent worse.	Bad.
21	3 days	J. A. J.	Continued.	Primary not bad.	Continually worse.	Very bad.
24	10 hours.	E. G.	Continued.	Distinct.	Continually worse.	Extremely bad.
THIRD DIVISION.—SIXTEEN CASES.						
2	3 weeks	P. M.	3 or 4	Slight.	Intermittently worse	Worse at any time.
3	2 weeks	S. W. R.	1	Slight.	Intermittently worse.	Worse at any time.
5	2 weeks	E. S.	5	Distinct.	Continually intermittently worse.	Worse at any time.
6	3 weeks	D. B.	2 or 3	Distinct.	Continually intermittently worse.	Worse at any time.
8	3 weeks	E. C.	2	Very slight.	Continually intermittently worse.	Worse at any time.
9	2 weeks	E. C.	2	Very slight.	Continually intermittently worse.	Worse at any time.
10	2½ weeks.	W. B. S.	2	Very slight.	Continually intermittently worse.	Worse at any time.
11	4 weeks	D. E. Y.	3	Very slight.	Continually intermittently worse.	Worse at any time.
12	10 days.	D. W. P. C.	2	Very slight.	Continually intermittently worse.	Worse at any time.
13	2 weeks	A. B. S.	3	Very slight.	Continually intermittently worse.	Worse at any time.
14	3 weeks	J. A. J.	2	Very slight.	Continually intermittently worse.	Worse at any time.
15	2 weeks	E. T.	2	Very slight.	Continually intermittently worse.	Worse at any time.
18	2 weeks	E. H. S.	2	Distinct.	Continually intermittently worse.	Worse at any time.
20	2 weeks	W. B. S.	2	Slight.	Continually intermittently worse.	Worse at any time.
22	2 weeks	P. M.	2	Slight.	Continually intermittently worse.	Worse at any time.
23	10 days	S. B.	2	Distinct.	Continually intermittently worse.	Worse at any time.
16	9 months, 6 weeks fetus. Full term dead child.	J. A. J.	None	Very slight (no doctor).	No trouble till term labor pain. Re-current severe labor pain.	Extremely bad.
						Death.

in each it was continually becoming worse. Four cases (4, 7, 17 and 19) were operated on when in extremely bad condition. Each of these had one or more recurrent hemorrhages; the first attack not having alarmed the attending physician. The primary summons for care preceded operation in each of this group from two and a half to five days. The seriously alarming recurrence in each preceded operation by from two to five hours. When operation was performed each of these cases was experiencing shock. Although these cases were not operated upon at time of primary hemorrhage, the condition occasioned by recurrent bleeding places them in the same category as if the alarming condition was primary. This difference I wish to emphasize, however, that had surgery been applied in the primary hemorrhage when lesser bleeding and depression were present it is fair to assume the alarming recurrent condition would not have occurred. I view this group as having received immediate operation since each was operated upon as soon as active arrangements could be made for the operation subsequent to the initial alarming symptoms. At least they present all the difficulties which the severer cases of primary rupture possess. The observation of them, therefore, serves a stronger argument to favor immediate operation. Each recovered.

The next division of the series consists of sixteen cases (2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 18, 20, 22, 23) classed as being treated by remote operation. The time which operation was performed subsequent to rupture, varied from two to six weeks. It had not been deliberately selected at time of rupture. The patients had all been treated with enforced body rest and with as much functional rest as could reasonably be given. These cases had all been treated for peritonitis—a treatment similar to, if not identical with the method advocated for the cure of ectopic rupture by those recommending remote operation. All of these cases recovered. The recovery, however, was subsequent to a more difficult operation, fraught with adhesions, visceral distortion, and often with inflammation.

One single case (16) is grouped alone and is doubtful of deserving a place in this series. The only excuse for its being included is due to the pregnancy being extrauterine origin. The fetus attained full growth, then perished and was retained within the abdominal cavity six weeks beyond maturity. Futile efforts were directed by the attending physician to gain expulsion via vagina. The directions were given without appreciat-

ing the child's extrauterine position. I removed by laparotomy the dead and macerated child from an already exhausted woman. Death ensued. No doubt is entertained by me that had this conception been removed at the time of rupture, the woman's life would have been conserved, nor would the birth rate have been decreased. So rare, indeed, is it possible to secure a living child, the product of an extrauterine gestation, that the hazard imposed upon maternal life justifies the condemnation of such effort in the light of present-day efficiency.

HEMORRHAGE FROM ECTOPIC RUPTURE IS DANGEROUS.

Hemorrhage from a ruptured ectopic sac is capable of fatal issue; has in the past induced death, and will, if uncontrolled fill future premature graves. Hemorrhage may check itself, but being checked it has no guarantee of control, in truth not only predisposes to recurrence, but promises a more aggravated form. There is but one sure and dependable control of a bleeding vessel. That control comes through the gateway of surgery. The needs are positive and definite. Its immediate application should not be delayed, unless by delay there is gained diminished danger that balances in favor of postponed action. What justifies procrastinating in the fulness of increasing danger and aggravating hazards?

SHOCK DOES NOT CONTRAINDICATE OPERATION.

Whether or not the shock associated with the rupture is an entity unto itself; or is precipitated by other causes than bleeding; or is occasioned solely by the hemorrhage, of this I am convinced: That the hemorrhage exerts positive influence upon the initiation of shock and proportions the severity of its manifestation. If this be true, it is evident that early positive control of bleeding opposes progressive shock depression. With the present definite assurance that shock can be remedied by vasomotor stimulation and by the introduction of compensating fluid contents into the blood-vessels, the horrors of adding operating aggravation to the existing shock are lessened. The benefits attained to overcome the shock by prompt operation overbalances the additional hazard the operation incurs; and rather weighs in favor of operation for the treatment of the shock arising from this cause.

CONSERVATION OF COMFORTS IS FAVORED BY EARLY ACTION.

The first object in the care of a diseased condition possessing dangerous proportions is to conserve life; then to conserve comforts; economize time of invalidism and promote return of health. Delayed operation prolongs the associated discomforts, not only by the additional time entailed in waiting for operation, but also necessitates a longer and more discomforting convalescence. The days, or weeks, waiting not only extends the time of suffering, but increases the intensity. To tolerate the presence of a blood clot in the peritoneal cavity is to invite inflammation with all the associated pain and various discomforts of peritonitis. The removal of this inflammatory mass leaves the serous surface oozing, which condition predisposes to subsequent adhesions with all the discomforts such adhesions entail. The additional discomforts either in time, duration, or intensity are not justified by any corresponding benefits gained by such delay.

DELAYED OPERATION FAVORS PROLONGED INVALIDISM.

Prolonged invalidism is easily acquired by a passive subject; difficult of avoidance in one exhausted physically; and is almost unavoidable in a neurotic individual deprived of much blood with subsequent peritonitis. The tolerance of removing an unruptured ectopic sac has but little demand upon the patient. The prompt removal of a ruptured or aborted sac with little blood loss, occasions but slight additional drain; but a large hemorrhage followed by prolonged suffering, sacrificing physical, mental, and nervous resources incurs prolonged invalidism to partially pay the debt of procrastination. Prompt surgical application at least reduces the period of invalidism if it does not give full exemption therefrom.

EARLY OPERATION FAVORS PROMPT REGAIN OF HEALTH.

Possibility of, and time required for, regain of health depend principally upon amount of blood lost, damage to implicated organs and malevolent psychic impressions. An individual in otherwise good health is capable of compensating for the loss of a small amount of blood by supplying the lost quantity with but slight disadvantage. If the quantity lost be large, not only

is the difficulty made greater measured by the greater amount required, but also by the handicaps of having deficiently nourished organs to functionate. The disadvantages are increased with almost geometrical proportions as the quantity of blood lost increases. The time required for the regain to health is practically proportionate to the amount of blood lost.

The blood collection becomes a foreign body possessing its adverse characteristics. Physically it displaces and contorts adjacent organs. As an irritant it promotes inflammatory action. By the displacement and distortion, derangement of function results. Inflammatory processes impair function and effects to cripple normal organic action. Should infection engraft itself upon the blood collection, permanent invalidism is threatened. Repeated psychic shocks induced by repeated pains, frights, recurrent apprehension, discouragement from prompt and positive improvements induces neurosis. There is no doubt that such experience for the patient prolongs her invalidism and handicaps her regain of health.

Shock, hemorrhage, inflammation, discomforts, duration of invalidism and promise for complete return of health, begs full consideration in determining action for the care of those suffering from ectopic gestation. It is my conviction that delayed operation imposes unjustifiable penalties upon the patient. The significance of delayed operation is exhibited in:

Greater loss of blood.

Possible loss of life occasioned by hemorrhage.

Increased shock depression.

Recurrent hemorrhage producing worse condition than first.

Operation fraught with greater difficulties.

More extensive pathology.

Increased discomforts measured by time and intensity.

Crippled organs with deficient functions.

Protracted invalidism.

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THE TREATMENT OF ECTOPIC PREGNANCY

WITH REPORT OF CASES, INCLUDING A CASE OF LITHOPEDION
COMPLICATING UTERINE PREGNANCY.¹

BY

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FIRST aid to a victim, bleeding from a severed artery, say of the forearm, would be, according to all principals of surgery and of common sense, to check the hemorrhage. No delay is admissible. In the absence of proper facilities for doing a formal operation, the use of any make-shift which will accomplish the result, is good surgery. No physician, no matter how averse to doing surgical work, would stand idle while a consultant was being secured. He is face to face with an emergency.

It has been taught that terminated ectopic pregnancy parallels the condition described.

Four years ago, when I was preparing my first report of cases in which operation was deferred, I searched in vain for encouragement from the then prevalent teaching. There had been no instruction to the general practitioner as to any course of procedure pending the arrival of the surgeon. The dictum had gone forth to operate immediately. Naturally, the practitioner, no matter how distasteful the prospect, felt in conscience bound to do the best he could in the face of this dire condition. The number of lives thus sacrificed will never be known. The mortality rate of skilled surgeons was extremely high.

It was this teaching that aroused protest. In May, 1907, before the American Gynecological Society at Washington, Hunter Robb read a paper entitled "Ectopic Gestation with special reference to the Treatment of Tubal Rupture."

In May, 1907, a paper entitled "Deferred Operation in Ectopic Pregnancy" was read by F. F. Simpson before the American Gynecological Society.

The writer's paper "The Treatment of Ectopic Pregnancy" was read before the Penna. State Medical Society at Reading, September, 1907.

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists held at Louisville, Ky., September 26-28, 1911

The experience of the essayists had been identical. They had observed no deaths from hemorrhage and operation deferred to a time of election had been practically without mortality. This served to emphasize what was already clinical history, namely, that the majority of terminated ectopics do not die immediately from hemorrhage and that the worst type of cases may recover. For every surgeon, every hospital interne knew that in the majority of instances these cases came to operation after sufficient time had elapsed for a continuous hemorrhage to have caused death—frequently days and weeks having passed since the initial symptoms. Many practitioners of experience could cite examples in which death seemed impending when either from a failure to make a proper diagnosis or the patient's refusal to submit, operation was deferred with advantage.

That practice and sentiment has undergone a change may be readily seen from the following, taken from the literature of the past four years.

"To say that every case of ruptured ectopic gestation should be operated upon at once is certainly taking an extreme view." (Blume.)

"An analysis of cases in which there was profound collapse from intra-peritoneal hemorrhage, but in which nothing in the history pointed to previous intra-peritoneal bleeding, shows that by far the greater majority rally from the bleeding sufficiently to come well out of the shock.

To operate upon a patient in profound collapse from a primary hemorrhage is, in my opinion, a mistake; because, with proper treatment, the patient may rally in the course of a few hours." (Boldt.)

"The circumstances and conditions should be well weighed before one decides to interfere." (August Martin.)

"So far, I have had no death following one of these operations, and as a rule, I would wish to be classed among the conservatives who prefer to wait rather than operate in a case of immediate collapse when I am satisfied that the collapse is due to hemorrhage." (Gordon.)

"There is no doubt as to the advisability of considering every case of ectopic pregnancy as surgical, but the question is debatable whether in this 5 per cent. operation should be done immediately during shock or deferred until shock has disappeared." (Bovee.)

"I confess myself to be on the side of those who would wait in the case of a very dangerous condition, watching the patient most carefully before deciding to operate." (Gardner.)

"Some patients will die before surgical aid could reach them; others will die in spite of it, and some will die because of it;

surgical interference having taken place too hurriedly, without proper preparation." (Krug.)

"Cases seen after rupture should likewise have operative treatment, if in suitable physical condition.

"If the patient can be operated on with good surroundings and in condition that promises survival from operation, I prefer early operation, rather than run the risk of repeated hemorrhage." (Hunner.)

"I believe it will be better to give a little time for the patient to rally rather than rush upon the scene in the so-called "pen-knife operation" state of mind. I believe that more patients will be saved by the plan which gives time enough to secure a proper environment and such restoration of the vitality as may be required to withstand the additional operative shock. I believe I have saved lives from such a course that would have inevitably been lost, if I had immediately operated with the patient still in collapse." (Baer.)

Those practicing immediate operation claim:

1. That it is impossible to determine which particular case may continue to bleed or at what moment a secondary hemorrhage may occur, therefore, operate at once.

It is generally conceded that in the majority of terminated ectopic pregnancies operation may be safely deferred. It may likewise be admitted that operation may be done at once, in the same type of cases, with a comparatively low death rate, if performed by a competent surgeon, under the same conditions that he would require for other abdominal work. But I wish to particularly refer to the smaller number—those patients which present symptoms sufficiently grave, as to make them appear to many surgeons as poor operative risks.

In the light of our present knowledge, is the surgeon justified in taking a chance?

It is this class which has furnished a high operative mortality in the past. Surgeons who defer operation have had the experience that they almost invariably improve with appropriate treatment.

That many patients have died from ruptured ectopic pregnancy has never been denied. Some of my own cases have been so near death that I could readily imagine that a little greater shock, a little more hemorrhage, a little less resistance would have been almost immediately fatal.

Recently I was called to a case, but the patient was dead before I saw her. She died within fifteen minutes after the first symptoms of collapse. Autopsy revealed a ruptured cornual pregnancy. Nothing save operation before rupture would have saved her. But of the cases which stop short of this immediately

fatal issue, what percentage will die if operation be deferred and appropriate treatment instituted? It cannot be determined by the reports of cases such as the one to which I have just referred; it cannot be determined by the victims that reach the coroner who die with the condition undiagnosed and consequently untreated; it cannot be determined by fatalities following immediate operation or operations undertaken after a slight delay when the patient was still unfit for laparotomy; it cannot be determined by instances in which a wrong diagnosis is made and when naturally a wrong treatment is administered; it cannot be determined by cases diagnosed properly, but which are treated improperly. It can only be determined by a careful, accurate report of results by those who defer operation in those cases which are manifestly unfit for the ordeal.

How frequently will hemorrhage recur?

I believe not often if the patient be kept absolutely quiet. In none of my cases, in some of which operation was deferred longer than necessary, has this accident happened.

This is especially true of grave cases. In speaking of this type Bonifield says:

"The great loss of blood decidedly increases the coagulability of the blood stream favoring the formation of a firm clot. It will be days rather than hours before the blood stream approaches the normal, if it be not raised by injudicious stimulation; so there is little danger of the clot being forced out by the blood stream. Such a profuse hemorrhage is fatal to the ovum, so there is not likely to be another rupture."

The operator, then, who insists upon immediate operation in all cases, in order to justify his position must show an exceedingly low mortality rate; for it is not better than 20, 10, 5 or even 2 should die as a result of operation, rather than that one should perish without operation.

A second argument is, that delay causes an increased morbidity.

This should not weigh too heavily if temporizing is a life-saving process. I am convinced, however, that a reasonable delay does not result in much morbidity. As I have said before, in some of my cases, operation was deferred longer than was really necessary, yet I am sure no operation was more extensive than it should have been if I had operated immediately after rupture. The only difference was, that I could take time to examine other structures and remove them, if necessary, without risk to the patient.

There have been no post operative complications in any of my cases. With reasonable delay, sepsis is not apt to occur if it does not already exist at the time of rupture. Bovee very truly says, that "the presence of a severe form of infection may overwhelm the patient after the most wisely and skilfully performed operation." Statistics show that a large percentage of deaths following immediate operation are due to sepsis. Cases in which there is a co-incident infection are to my mind safer if operation be deferred. Aside from the usual and ordinary dangers of immediate laparotomy, the necessary incompleteness of the operation and the low vitality of the patient render her a peculiarly easy prey to septic organisms.

In two cases already reported where I had reason to believe that an infection existed, each was treated as a pelvic peritonitis. Both patients were operated upon at a time of election with prompt recovery. A staphylococcic infection was demonstrated in one case.

A third argument offered is:

That immediate operation does away with all disadvantages of delay, and is not a dangerous procedure.

Elis Essen Möller says that "Immediate operation offers no more risks than later operation or than any other abdominal operation." This would be important and would stop all controversy if surgical history would bear out the statement. Most surgeons are prepared to admit that opening the abdomen of a patient profoundly shocked and anemic offers decidedly graver prospects than a simple appendectomy or a shortening of round ligaments.

As a matter of fact, many surgeons operating at once in all cases, Deaver, Harris, Ladinski, Vineberg and others, report a low operative death rate. Surgical advancement has made their results possible. But even if it were the rule for skilled operators in well appointed hospitals to show the very best results in immediate operation, it would still be a most dangerous impression to be abroad, that all cases of terminated ectopic pregnancy must be rushed pell mell to abdominal section. On the contrary, the internist who sees these cases first should be instructed as to what constitutes first aid, pending the arrival of the surgeon.

Absolute rest; external heat; morphia to secure quiet and combat shock; strychnine sulphate in small doses as a vaso-motor stimulant; physiologic salt solution slowly by rectum or subcutaneously—under no circumstances administer intravenously.

Upon the surgeon will lie the responsibility as to whether operation be undertaken at once or deferred. He should decide first whether or not the patient is a good operative risk. If not, active hemorrhage would be the only justification for immediate operation; to determine this, he should use every diagnostic means at his disposal and if in doubt should bear in mind the cold, clinical fact, that it is the exception to find the bleeding persistent. I wish to add the following cases to those already reported:

CASE I.—The Pittsburgh Hospital No. 8514. Admitted 9.00 P. M.

In the afternoon, patient has been seized with a sharp pain in abdomen. According to her physician, she was cold, pulseless and for a time unconscious. When admitted to hospital, a few hours later, her condition had materially improved, but was still grave. There was marked anemia and restlessness, temperature 99, pulse 108 and of poor quality, respiration 36.

Treatment.—Absolute rest; morphine sulph. grain $1/4$, atropin grain $1/150$; nothing by mouth; proctoclysis, normal salt solution Oi every six hours.

Condition the following day (morning): temperature 98.6; pulse 88; respiration 24. Blood count; hemolysis 45 per cent.: R. B. C. 1,890,000; W. B. C. 13,400.

Treatment.—Absolute rest; proctoclysis, continuous.

Diet.—Beef juice, egg albumen.

Improvement steady. Further treatment consisted in maintaining quietude and gradually increasing diet.

At operation, the fetus was found adherent to parietal peritoneum. An interstitial pregnancy was ruptured through the uterine wall and the tear was so extensive that it was decided to remove the body of the uterus. One ovary was left. Recovery without incident.

Condition upon admission to hospital: temperature 99; pulse 108 and of poor quality; respiration 36; marked anemia; hemolysis 45 per cent.; R. B. C. 1,890,000.

Condition at operation: temperature 98.4; pulse 80; respiration 20; blood count: hemolysis 80 per cent.; R. B. C. 3,400,000.

This case is interesting because it is of that type which is considered by some to be invariably, quickly fatal.

Now the technique of immediate operation is somewhat as follows: Open the abdomen quickly; grasp the injured tube and rapidly tie off the blood supply; remove as much of the clot as possible, without taking too much time for completeness; close the abdomen, etc., etc.

In this case, no matter when the operation had been performed, nothing less than hysterectomy would serve, and the surgeon attempting relief at a time when haste is the sine qua non would have found himself put out in his good intentions.

I think it may be conceded that in this particular instance, the patient's chances were improved by delay.

CASE II.—Pittsburgh Hospital No. 7123. Admitted to hospital in good general condition. Some hours later, I was called hurriedly. I was in the hospital at the time, but had not yet visited the ward. The nurse explained that the patient had just had some sudden severe attack. I found her cold, pulseless, pale and gasping. She was unable to speak, except some incoherent words. But the picture was one of ruptured ectopic pregnancy.

Treatment.—Morphine sulphide grain 1/4; atropin grain 1/150; external heat; absolute rest.

She gradually reacted. First recorded temperature and pulse 96.4 and 140 respectively.

Normal salt solution 6i per rectum every six hours.

The following day temperature 98; pulse 120; blood count: hemolysis 55 per cent.; R. B. C. 2,600,000.

Improvement steady. At operation temperature and pulse normal. Blood count: hemolysis 78 per cent.; R. B. C. 3,496,000.

In this case the shock was so profound that I feel sure any operative procedure whatever, at the time I first saw her, would have proven fatal. After twenty-four hours, it would still have been hazardous, but later she became a most excellent operative risk.

CASE III.—Pittsburgh Hospital No. 7883.

Operated upon as soon after rupture as preparations could be made. Patient was anemic, but there was little shock, pulse 100 and of fair column.

At operation there was a large amount of blood in the abdomen. Right tube, ruptured about one-half inch from the uterus, was removed. Recovery.

In this case, hemoglobin taken immediately after operation, showed 70 per cent. The following day it showed 55 per cent. Indicating, as pointed out by Crile that the hemoglobin percentage does not fall immediately after hemorrhage.

CASE IV.—Columbia Hospital No. 4115.

Operated upon within an hour after tubal abortion. Her chief symptoms were a missed menstrual period, uterine bleeding and a sudden sharp pain in abdomen. There was little shock and no apparent anemia. At operation, there was found only a moderate amount of blood. The left tube was removed. Recovery.

It will be observed that Cases III and IV were operated upon as soon as possible after the termination of the pregnancy. Both cases were in suitable condition and immediate operation offers the advantage that the patient is spared a double period of convalescence. This fact, however, should have no weight at the expense of additional risk to the patient's life.

CASE V.—Pittsburgh Hospital No. 8528.

Patient came to my office and gave this history: Her past period was delayed ten days, slight uterine bleeding had persisted for the past three weeks. She complained of some pelvic pain.

Examination made very gently revealed a small mass in the right tube. A diagnosis of unruptured ectopic pregnancy was made and she went to the hospital direct from my office. An unruptured pregnant tube was removed at operation. Prompt recovery.

If there be any point in surgery upon which all surgeons agree, it is the necessity for immediate operation in unruptured ectopic pregnancy. Fortunately, the diagnosis is made much more frequently now, than in the past. The condition presents definite and constant symptoms and if our teachers and text-books would picture it as vividly as they do the collapse following rupture, we might look forward to the time when early operation would be the rule and there could be no difference of opinion, as to what to do with the patient once the diagnosis was made.

CASE VI.—Pittsburgh Hospital No. 7146. Referred to me three weeks after the beginning of her illness. She gave the usual history of ruptured ectopic pregnancy. At operation, ruptured left tube, encapsulated blood clot and right tube removed. Recovery.

CASE VII.—Pittsburgh Hospital No. 7491. Referred to me one week after beginning of illness. Patient in good general condition. Gave the usual history of ruptured ectopic pregnancy. Pelvic mass easily palpable. At operation, a left tubal abortion was demonstrated. Encapsulated blood clot and left tube removed. Recovery.

CASE VIII.—Pittsburgh Hospital No. 7684. Patient gave typical history of ruptured ectopic pregnancy occurring some days before admission to hospital. She had been in good health. Her last period had been delayed and had persisted abnormally. She was finally seized with a severe pain in abdomen causing her to faint.

Upon admission to hospital: temperature 98.6; pulse 90; blood count, hemoglobin 48 per cent.; R. B. C. 3,296,000; W. B. C. 12,400.

A distinct mass in left side of pelvis. Operation refused. She remained in hospital three weeks and left in normal condition except for the pelvic mass which was considerably reduced in size.

CASE IX.—Columbia Hospital No. 2610. Admitted ten days after attack, typical of ruptured ectopic pregnancy. General condition good. Operation showed left tubal abortion. Large encapsulated blood clot and left tube removed. Recovery.

CASE X.—Columbia Hospital No. 3032. Admitted to hospital giving history indicating ruptured ectopic pregnancy of three

weeks standing. General condition good. Pelvic mass could be palpable through abdomen. Right tube and blood clot removed at operation. Tubal abortion. Recovery.

CASE XI.—Columbia Hospital No. 000. Patient had a sharp, sudden pain in abdomen at 5:00 P. M. September 20, 1910. She was in collapse when seen by her physician. Admitted to hospital at 11:00 P. M. At this time she had reacted slightly. Pulse was merely perceptible and could not be counted. Temperature 98.6; air hunger marked. Severe epigastric pain.

Treatment.—Morphin sulphate grain $1/4$. Atropine grain $1/150$ hypodermatically.

Normal salt solution per rectum, continuously—about eight ounces per hour. Absolute rest.

Condition the following day: temperature 98; pulse 124; blood count, hemoglobin 45 per cent.; R. B. C. 2,800,000.

Improvement steady. Blood count October 4, hemoglobin 70 per cent.; R. B. C. 4,280,000.

Operation October 5, removal of right tube, showing rupture about one inch from uterus. Appendix also removed.

CASE XII.—Pittsburgh Hospital No. 8752. Admitted to hospital with following history: She was seized with acute colicky pain in lower abdomen, with marked tenderness and rigidity. Symptoms gradually subsided and ceased in about twelve hours. A second attack occurred two days later accompanied with moderate degree of shock.

Operation two days later. Ruptured tube removed. Recovery.

CASE XIII.—Pittsburgh Hospital No. 8752. Patient was seized with severe abdominal pain accompanied by vomiting. Shock moderately severe. She gave the usual typical history indicating a ruptured tubal pregnancy.

Operation within an hour or two after the attack. A large amount of blood found in the abdomen. Right tube ruptured about three-quarters of an inch from body of uterus. Tube removed, as was also the appendix. Recovery.

An interesting point indicating that a blood count made soon after rupture cannot be depended upon as a means of diagnosis in doubtful cases is afforded in this case.

Blood count immediately after operation: Hemoglobin 75 per cent.; R. B. C. 4,900,000.

Two days later, hemoglobin, 60 per cent.; R. B. C. 2,540,000.

CASE XIV.—Pittsburgh Hospital No. 9655. Patient referred for curettement following a supposed incomplete abortion.

The abdomen was opened and the unruptured pregnancy tube removed. Recovery.

CASE XV.—Pittsburgh Hospital No. 9800. Admitted to hospital two weeks after the beginning of her illness, which had not been diagnosed.

History typical of ruptured ectopic pregnancy. A large mass could be palpated through the abdominal wall. Patient ex-

tremely anemic. Blood count, hemoglobin 49 per cent.; R. B. C. 1,126,000. Operation deferred for one week with only slight improvement. At operation both tubes were removed with a very large encapsulated blood clot. Vaginal drainage. Recovery.

CASE XVI.—Pittsburgh Hospital No. 9693. Admitted to hospital three weeks after rupture. Diagnosis had not been made. A large pelvic mass was palpable. At operation, the ruptured tube and large encapsulated blood clot was removed. Vaginal drainage. Recovery.

CASE XVII.—Columbia Hospital No. 6374.

Admitted to hospital June 27.

History indicated ruptured ectopic pregnancy three days previously. General condition good.

Operation June 29.

Ruptured left tube and blood clot removed. Recovery.

CASE XVIII.—Columbia Hospital No. 6116.

Patient sought relief from excessive vomiting of pregnancy.

Examination revealed pregnancy of about four months duration. To the right of the pregnancy uterus a mass was distinctly palpable. By vaginal examination could be felt what seemed to be the bones of a fetal head.

The history was elicited that six years ago her menses had ceased, her abdomen enlarged and that she experienced all the subjective symptoms of pregnancy. After six months, however, the menstrual function was reestablished and all other symptoms gradually disappeared. With this history and the physical examination a diagnosis was made of lithopœdion complicating pregnancy.

Operation April 28. The mass was encapsulated and was almost entirely covered by right broad ligament. There were a few intestinal and omental adhesions. Removal was easily accomplished. Fetus corresponded in size to a five or six months pregnancy. Abdomen closed without drainage. Convalescence normal. Vomiting ceased promptly. The remaining months of her pregnancy were uneventful and is at present passing through a normal puerperium.

CONCLUSIONS.

1. Ectopic pregnancy at any stage is purely a surgical condition.
2. The time of operation, in terminated ectopic pregnancy should be determined entirely by the patient's fitness to withstand surgical interference.
3. The time of operation should be decided by a competent surgeon, each individual case upon its merits.
4. Operation should be done at the earliest period of election.
5. To justify any given course of procedure, a low mortality rate must be shown.

LITHOPEDION.¹

REPORT OF A CASE, WITH A REVIEW OF THE LITERATURE.

BY

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(With six illustrations.)

REPORT OF CASE.

CASE.—Mrs. M. D., aged fifty-four years. Widow for fourteen years. Three children, one miscarriage; last child born twenty-four years ago. Menstruation perfectly regular from the time of birth of last child, until it suddenly ceased, at the menopause, four years ago. No period missed during the intervening years, and nothing to suggest another pregnancy. The miscarriage was the third pregnancy, one child being born afterward. Following the birth of the last child the abdomen, which was unusually large during pregnancy, remained larger than it had been previously. The patient was a large woman, so that no significance may have attached to this fact. She was always well and strong, except for some indigestion, and palpitation of the heart, apparently of purely functional origin.

The patient consulted me, February 10, 1911, giving a history of having noticed a lump in the lower abdomen two years before, which she thought had been increasing in size of late. She had been receiving electrical treatment "to absorb it," and had also been given large amounts of various medicines.

Physical examination revealed what was supposed to be multiple fibroids of the uterus. Four distinct tumors were felt, two of which seemed rather sharp than rounded. A mass the size of an adult human head extended up almost to the free border of the ribs, on the right side, across toward the bladder in front and the rectum behind. Adhesions between the tumor and the intestines could be made out.

The tumor simulated a fibroid connected with the uterus, seeming like a tumor from the fundus, but it was peculiar in that it was very hard, and that two sharp projections could be distinctly felt. The diagnosis was made of fibroid tumor of the uterus, with calcareous degeneration.

Some varicose spots were noted in the veins of the legs. No appreciable atheroma in palpable vessels. Heart and lungs apparently normal; urine normal.

Early hysterectomy advised. Patient admitted to the New York Skin and Cancer Hospital, February 8, 1911. Laparotomy, February 20. Median incision, through right rectus. The mass

¹ Presented before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

in the lower portion of the abdomen was found to be adherent to the left tube and ovary. All around the mass was an apron of omentum, and to the upper portion of the mass the transverse colon was adherent.

The supposed multiple fibroids proved to be a lithopedion, the large mass being the head, the two sharp tumors the elbows, and the fourth mass presumably one of the knees.

The accompanying photographs, by the official photographer of the hospital, were taken as the lithopedion was being delivered. Figures 1, 2, and 3, show successive stages of delivery. Figures 4 and 5 show the lithopedion in different aspects.

The patient was returned to bed in very fair condition. Because of the severe traumatism to the peritoneum and the forcible breaking up of the many adhesions in the removal of the tumor, she was kept on a very light diet, and was making an uneventful recovery, with heart and lungs in excellent condition. She would have been discharged within a day or two, when, on March 9, seventeen days after the operation, sudden death occurred, under the following circumstances, which, though in no wise associated with the operation or related to the lithopedion, are nevertheless sufficiently interesting to warrant a report.

On the afternoon of March 9, friends and relatives called and gave the patient some apples and peanuts, which were carefully secreted under her pillow. At 8.30 that night she ate some of these, which caused severe vomiting, with violent retching. At 8.59 she died.

The autopsy findings showed pulmonary congestion; atheroma of the coronary arteries; air emboli and clots in the anterior coronary arteries; chronic nephritis.

As may be judged from the accompanying illustrations, the fetus was of about seven months' development, the body being fairly well formed. The lithopedion weighs 2 3/4 pounds.

Inasmuch as the woman (of whose moral status there is no question) had been a widow for fourteen years, the lithopedion had been carried for at least that length of time. Inasmuch, too, as she had not missed a menstrual period from the time of its establishment after the birth of the last child, twenty-four years before, the lithopedion had presumably been carried for that length of time. There was apparently no connection between the lithopedion and the miscarriage, which took place before the last pregnancy. It would seem, therefore, that the lithopedion was the result of a superfetation at the time of the last pregnancy. A small scar, found in the left tube just where the head lay, led to the conclusion that perhaps a tubal pregnancy occurred simultaneously with the uterine pregnancy, that this tube ruptured at an early stage, and that extratubal development continued up to about seven months, calcification of the extratubal fetus taking place after that time, the intrauterine fetus going on to full term in a normal manner. The calcifica-

tion may have begun at an early stage of development, proceeding so slowly that growth was not completely checked until about the sixth month. This is purely speculative, however.

The specimen is a true lithopedion, according to the generally accepted classification. x -ray examination failed to give any evidence to the contrary.

This case of lithopedion happens to be the first which I have encountered in a large gynecological practice and in a comprehensive obstetrical experience, the latter obtained in part during an internship at the Sloan Maternity Hospital. My interest in the subject was specially aroused, and a careful review of the literature was made, a synopsis of which is given below.

THEORIES OF FORMATION.

In reviewing the literature of the subject I found that there is quite a diversity of opinion concerning the classification of these formations. It may not be without interest to some of the readers of this contribution to review the chief theories concerning the etiology, development, and classification of the calcified fetus and its membranes.

Gould and Pyle (*Anomalies and Curiosities of Medicine*), give the following reference to the subject: "Israel Spach, in an extensive gynecological work, published in 1557, figures a lithopedion drawn *in situ* in the case of a woman with her belly laid open.

"He dedicated to this calcified fetus, which he regarded as a reversion, the following curious epigram, in allusion to the classical myth that after the flood the world was repopulated by the two survivors, Deucalion and Pyrrha, who walked over the earth and cast stones behind them, which, on striking the ground, became people. Roughly translated from the Latin, the epigram read as follows: 'Deucalion cast stones behind him and thus fashioned our tender race from the hard marble. How comes it that nowadays, by a reversal of things, the tender body of a little babe has limbs nearer akin to stone?'"

Küchenmeister (*Ueber Lithopedion—Archiv. f. Gyn.*, vol. xvii, p. 153, 1881), gives the most generally accepted theory concerning the formation of lithopedion, and the most widely accepted classification of the petrified or calcified products of conception. He classifies them, according to the extent and manner of calcification, as lithokelyphos, lithopedion, and lithokelyphopedion.

Lithokelyphos, according to Küchenmeister, originates in such way that the ovum as a whole, meaning the unruptured membranes and the fetus, is discharged into the abdominal cavity. This results in peritonitis, the products of which (masses of exudate) serve to strengthen the fetal membranes from without. The local organization of the exudate leads to the formation of strands and adhesions with neighboring organs, while the exudates that have been deposited on the fetal membranes themselves gradually undergo fatty degeneration; after this is completed, calcification follows, forming a stony capsule



FIG. 1.—Step in operation.

around the fetus, after the fluid which surrounds it has become absorbed. The fetus itself is involved in the calcification only at those points where adhesion between the fetus and its membranes has occurred during fetal life. As a rule the fetus is probably cast out dead in its membranes into the abdominal cavity. Sometimes this may happen in the course of diminishing viability, at a time when the locally adherent fetal membranes are still connected with the pseudouterus, the fetus promptly dying under the absorption of the waters.

Lithopedion originates in such way that, after the waters have escaped through a large tear, at the rupture of the fetal envelope, perhaps also of its pseudouterine sheath, the mem-

branes become wrapped around the fetus, the calcification beginning in the vernix caseosa between the fetus and the fetal membranes. In these cases a part of the fetal membranes may become detached from the placenta, and become twisted in strands as far as the point where the untorn membranes are wrapped around the fetus, after the fetus itself has been torn away from the umbilical strand and the placenta. It is not impossible, theoretically, according to Küchenmeister, for an entirely detached fetus to lodge in some place in the abdominal cavity, giving rise to local peritonitic exudates, and to receive



FIG. 2.—Step in operation.

a secondary envelope, without fetal membranes, in the course of time, after the exudates have been organized. Such an occurrence can be decided only by anatomico-microscopical findings in the sheath, in a given case. If the fetus is still in some way connected with the fetal membranes, it might possibly survive for some time after the rupture of the membranes, to which it is partially attached.

Lithokelyphopedion can be formed only in a case of a fetus which was already adherent to its membranes during fetal life.

Küchenmeister gives twenty-three cases of lithokelyphos, dating from 1728 to 1880; three cases of lithokelyphopedion, dating from 1582, 1659, and 1720; nineteen cases of lithopedion, dating from 1661 to 1877.

Freund (*Beitrage zur Geburtshilfe u. Gynaekol.*, vii, 1903), says the etiology of lithopedion formation has been referred by some observers to purely physiological causes. The theory propounded by Kroemer is considered very plausible by Freund. According to Kroemer the dry metamorphosis is introduced by the withdrawal of the amniotic fluid and of the body-juices, this taking place more rapidly in proportion to the absorptive power of the surroundings. Hence this is more likely to occur in the peritoneal cavity, not so easily in tubal pregnancies, rarely or perhaps never in the uterus. Freund, in continuing this explana-



FIG. 3.—Step in operation.

tion, points out that the absorptive power of the surroundings is in its turn dependent on its capacity for reaction, meaning that the condition must be favorable for adhesions of the dead ovum with the fetal sac. This is the case where the sac consists mostly of connective tissue, muscle tissue, elastic fibers, and mucous membranes with their epithelium, being much less suitable for this purpose, or not at all. The scanty uterine lithopedia were not accepted by Webster (1896), who interpreted them as very probably of interstitial origin.

Next to these cases, the pregnancies in a so-called horn of the uterus enter into consideration, the interstitial and true tubal pregnancies following next in order. Apoplectic bloody extravasates around the ovum, and pathological loss of epithelium,

according to Freund, perhaps play an essential predisposing part for adhesions, especially as the connective tissue element in the sac wall progressively predominates with the further advance of all tubal pregnancies.

In the remaining ectopic gestations, the tuboovarian, tubo-abdominal, ovarian, and especially abdominal type, the pre-



FIG. 4.—Lithopedion. Front view.

dominant or pure connective-tissue character of the sac is sufficiently pronounced to explain the adhesions to the surroundings, which are responsible for the absorption and the excretions of the lime-salts, in consequence of the improved circulation through the inflammatory stimulus of the dead body.

The age of the fetus, according to Freund, in old ectopic gestations, is by no means easy of determination. In the most

favorable cases the anatomical findings (chiefly the length and development of the individual bones) are assisted by a good history, which clearly shows the onset of labor at the calculated term.

The weight of the reported lithopedions is not proportionate to the age of the fetus, and still less to the time of the retention. Oppel thinks the weight varies according to the stage of absorp-



FIG. 5.—Lithopedion. Side view.

tion or calcification, but reaches its greatest height in the third decade and the beginning of the fourth decade after pregnancy. Freund does not accept this interpretation, in view of the enormous difference in weight of the individual reported cases. He admits that the age of the fetus, and the mass of deposited lime salts, furnish the main factors in the increase in weight. A definite system cannot be formulated, however, especially as the second factor, in his opinion, depends principally upon local

causes, in a given case, such as extent and importance of the adhesions, and especially circulatory relations.

The outcome of lithopedion formation may be *suppuration*,



FIG. 6.—Radiograph of lithopedion.

although this is less apt to occur than in other extra-uterine pregnancies. There is a possibility of infection from adherent intestines. Infectious diseases are very apt to induce suppuration of all tumors, including lithopedion. Pressure-

necrosis, with subsequent secondary infection from the outside, may give rise to suppuration.

The carriers of lithopedions are remarkably free from troublesome symptoms, according to Freund. Cases are on record which remained perfectly free from disturbances for many years, when fistula formation, suppuration, and marasmus followed. Others suffered from minor disturbances, pain on change of position, or during defecation; digestive disturbances, etc. In some of the reported cases the unrecognized pregnancies terminated in more or less severe peritonitis, from which the patients recovered and remained free for the period of thirty and eleven years respectively in two cases, finally being compelled by dangerous abdominal symptoms to undergo operation.

Subsequent pregnancies and deliveries have been known to occur without trouble of any kind. In Kroemer's case there were three spontaneous abortions, in Freund's case there followed one natural birth, and in Leopold's case three easy confinements occurred while the lithopedion was being carried.

Among eleven cases compiled by Freund, six women (54 per cent.) reached a very advanced age without an operation. Among the remaining five, three recovered, and two died, after operative intervention (Freund's and Hammer's cases). In these two instances the therapeutic measures were greatly hindered by suppuration and cachexia, which terminated in death.

Lithokelyphopedions perforate as the result of pressure erosion, and usually do not undergo suppuration until secondarily, through germs entirely from the outside. The more connective-tissue-like the ectopic sac, and the more vascular its adhesions, the more likely are mummification and calcification of the entire ovum to occur.

The diagnosis of lithokelyphopedion is based upon calcification of the fetal membranes, and adhesions of the same with the fetus, which is likewise calcified, especially at the points of contact.

Werk (*Winchel's Handbuch der Geburtshilfe*, vol. ii, Part I, Wiesbaden, 1904), says calcification is the terminal stage in the series of changes undergone by the product of conception, when decomposition fails to occur.

The most detailed description of the calcification process, still admitted as correct in all the essential features, according to Werk, was contributed by Kieser, in his *Inaugural Dissertation*, Stuttgart, 1854. The latter described a lithopedion which

is still preserved in the collection of the Women's Clinic, in Tübingen. The specimen was obtained in 1720, at the autopsy of a woman ninety-four years of age. It was derived from an ectopic pregnancy in the year 1674, which is said to have been followed by two births at term. The fetus was much bent and folded, enclosed in a capsule of lime, covered on the outside with dry pseudo-membranes. Part of the surface of the fetus was adherent to the inner surface of the capsule. The superficial soft parts of the fetus were calcified in the area of the adhesions, while the fetus was otherwise in a state of simple mummification.

On the basis of the examination of this specimen, and careful study of the available cases up to 1854, Kieser arrived at the conclusion that in the formation of so-called lithopedion the deposit of calcium begins in the maternal envelope, and only secondarily involves the fetus (previously mummified), and only in those parts which are in contact with the covering layer.

Referring to Küchenmeister's work (op. cit.), Kieser gives the following exposition of the classification of the calcified products of conception: 1. Cases in which only the maternal envelope or sheath is calcified, whereas the fetus is simply mummified, and not adherent to the former—*Lithokelyphos* (from a Greek word meaning egg-shell). 2. Cases in which the calcification has also involved the fetus, which is adherent to the coverings—*Lithokelyphopedion*. 3. Cases in which the fetus alone is the seat of lime deposits. These are said to concern invariably a fetus lying free in the abdominal cavity, the vernix caseosa supplying the foundation for the calcium deposits, which form a crust of progressive thickness around the shrinking fetus—*true lithopedion*.

Küchenmeister's article, according to Kieser, did not materially contribute to the knowledge of the pathologico-anatomical character of so-called lithopedion, but laid more stress on the several varieties, and also enriched the obstetrical terminology in the nomenclature of these subdivisions. This utilization of the available material in the literature, in support of the division proposed by him, was considered by Kieser to be somewhat arbitrary. The type designated by Küchenmeister as lithokelyphopedion (for which he was unable to quote more than three examples, two inaccurate and arbitrary), is undoubtedly, in Kieser's opinion, the most common of all. He refers in this connection to the eleven cases cited by Freund (op. cit.),

and expresses the opinion that this number could doubtless be increased by other examples.

Kieser holds that the majority of cases of lithokelyphos were not examined thoroughly enough to exclude a partial participation of the fetus in the petrification. Hence the occurrence of this type is probably much less common than appears to be the case according to Küchenmeister. He also considers the third type, true lithopedion, to be represented by Küchenmeister in too voluminous a group. Almost all the cases grouped under this heading concern an abdominal fetus, as a rule with extensive peritoneal adhesions and pseudomembranous coverings. The latter are usually interpreted as fetal membranes, though it is considered by some to be a secondary envelope. This envelope represents the matrix for the introduction of lime into the fetal body itself.

Concerning the *source of the lime salts* (calcium carbonate and phosphate) excreted into the fetus and its coverings, Kieser holds that the salts deposited in the fetus itself as well as its coverings must have been supplied from the outside, as the fetal body does not contain enough soluble calcium salts in its body-juices to permit the formation of macroscopical deposits. The supply of lime salts can therefore take place only through the maternal blood current and juices, and the formation of deposits can occur only in areas which are still within the reach of the latter. It has been known, since the days of Virchow, that the occurrence of the calcification-process requires for its basis, besides the presence of necrotic tissue, also a diminished circulation, as to the velocity and extent of the flow.

This condition is met with in the walls of old closed amniotic sacs, as well as in the secondary coverings of a fetus that has been originally free in the abdominal cavity. For, in the course of retention of the dead fetus, as Kieser points out, the specific stimulus of pregnancy, which dominates the development of the bloodvessels, progressively loses in efficiency, while the peritoneal irritability gradually subsides, all this being associated with an extensive retrogression of the vessels in the fetal coverings. Moreover, it is also necessary to take into account the influence of senile involution, in the numerous cases of lithopedion which have been reported in middle-aged and even very old women.

Under the influence of this vascular degeneration, the circulation is apt to lessen especially early and thoroughly in the innermost layers of the fetal envelope, in the contact-zone between

the maternal and the fetal tissue, which for some time possessed the character of granulation-tissue, and therefore retains a tendency to cicatricial contraction.

Proportionately, deposits of lime are seen to occur, first at the internal boundaries of the maternal enveloping tissue, while the calcification only gradually involves also the external layers of the fetal capsule. This serves to explain the not uncommon arrangement in layers (stratification) of the lime-shell. It also explains, according to Kieser, the fact that in cases of complete calcification of the fetal capsule there usually still exists an outermost vascularized tissue-layer, free from calcium.

After an inflammatory process, penetrating from the maternal envelopes into the dead fetus, has established a communication between the two, the vascularized connective-tissue substance in the dead fetal tissue undergoes the same fate as the parietal tissue of the walls. Contraction of scar tissue follows, with narrowing and obliteration of vessels, and after these retrogressive processes have run their course, lime begins to be deposited.

In a case observed by Kieser, of a lithopedion which was still carried in the abdominal cavity fourteen months after the death of the fetus, large collections of lime were found only in the facial region. The fetus, in this instance, was surrounded by a connective-tissue membrane, which was supplied with vessels by way of the adherent omentum, and which was widely adherent to the surface of the fetus. Small deposits of lime could be demonstrated, by microscopical examination, in other localities in the superficial layer of the body. These small deposits, without exception, were situated within the maternal connective tissue which had penetrated into the fetus, usually only in its deeper layers, more particularly at the tip of the wedge-like processes of the new tissue, which were pushed out into the subcutaneous layer. The small lime foci were often found lying in sharply outlined gaps of the subcutaneous layer, giving the impression of dilated capillaries.

In the further course of the process the dead fetal tissues themselves may also undergo calcification. This can take place, however, only in the immediate vicinity of the organizing maternal tissue, and still within the field of efficiency of the maternal juices.

The apparently free, genuine lithopedions originate in the same manner, according to the author quoted. After the fetus,

which has been studded with lime deposits from the penetrating maternal tissue, comes to be very old, it may happen that the maternal tissue contained in the fetus undergoes, as a whole, a retrogressive metamorphosis, terminating in calcification. The originally solid connection of these tissue-processes with their matrix, the maternal enveloping layer, in the meantime becomes again loosened.

This mechanism, together with the fact that the penetration of the maternal granulation-tissue into the fetus often takes place only in circumscribed localities, rather than large surfaces, accounts for findings such as those described by Wyder (*Archiv. f. Gyn.*, vol. xvii, p. 2541), and quoted by Kieser. In this instance a very old lithopedion presented flat islands of calcium at the internal surface of the lining membrane, interpreted as fetal membrane, to which corresponded foci of calcification in the skin of the fetus, some penetrating more deeply. The skin between these foci was unchanged, covered with lanugo, and only loosely applied to the sheath.

Kieser is convinced that almost all cases of peripheral calcification of the fetus originate in the manner described above. The lining membrane itself, whose tissue-processes form the basis or at least the starting-point of the calcification within the fetus, may remain free from coarse calcium deposits. Even when there is no closed envelope around the fetus, there always exist partial adhesions to the omentum, etc., from which the maternal tissue distribution within the peripheral parts of the fetus, which precedes the calcification, may take its origin.

Kieser holds that there are no conclusive proofs of a mode of calcification and crust formation derived from the vernix caseosa, as assumed by Küchenmeister. He does not deny that from the fluid which surrounds the living fetus lime salts may become deposited upon the same after its death; he believes, however, that such a deposit amounts to no more than a slight finely granular precipitate, of the character described in certain cases.

Lime salts may also be precipitated from other fluids which for a long time surround a necrotic, more or less mummified or disintegrated fetus, as, for example, in chronic suppuration in the fetal membranes. These lime salts may encrust or even impregnate portions of the fetus, which accounts for the frequently reported findings of similar material, lime-encrusted skeletal fragments, in perforations of a suppurating sac.

Even the impregnation of the entire fetal body with lime

salts, a true petrification as far as the core, will have to be admitted as possible under the above-described conditions. Kieser holds this view, and also states that this is most likely to occur in a fetus that has perished at an early stage of development. A petrified fetus of this kind is cited as being preserved in the Würzburg Women's Clinic.

Kieser calls attention to the fact that, besides a dead fetus that has been carried for a considerable length of time, with or without calcification of the fetus or its coverings, deposits of lime, sometimes very abundant, are usually found in the necrotic placenta. The deposits in such case are free within the intervillous spaces, in the form of loose crumbling masses, and undoubtedly derived from the maternal circulation in these spaces, which very gradually subsides after the death of the fetus. Foci of calcification may or may not be simultaneously present in the wall of the fetal envelope.

The occurrence of a true ossification, instead of simple lime-impregnation, does not seem to Kieser to have been proved.

The remarkable state of preservation of lithopedions is accounted for by Kieser as due to the presence of two conditions, viz., freedom from microorganisms, and prompt dessication of the fetal cadaver. Softening of the cadaver from within and from without is thereby prevented, and a state of dry necrosis is brought about, which alone permits a conservative reaction on the part of the organism of the host. Microscopical examination serves to show that the preservation concerns only the solid and more highly differentiated structural elements, the muscles as well as the connective tissue and elastic fibers. Since these form essentially the frame-work of all organs, the external configuration of the organs is retained. The cellular tissue-constituents, on the other hand, undergo the characteristic changes of dry necrosis, in such a way that the cellular substance shrinks, or undergoes granular disintegration.

Strauss (*Zur Kasuistik und Statistik des Lithopedions*, *Archiv. f. Gyn.*, vol. lxxviii, H. 3, 1903) contributes a personal observation on a case of lithokelyphos, according to Küchenmeister's classification, and reviews the literature of the subject from 1880 (up to the time of Küchenmeister's article) to 1900. He collected eleven cases of lithokelyphos, six cases of lithokelyphopiedion, and twenty-one cases of lithopedion.

Strauss believes lithopedion to be the most frequent formation, as it requires the fewest conditions for its occurrence, and is

rendered possible by the fact that the most common outcome of extrauterine pregnancy consists in rupture of the sac.

The frequency of lithopedion in extrauterine pregnancy is given by Schrenck (*Ueber ectopische Gravidität*, Inaugural Dissertation, 1893) as 1.8 per cent., or eleven among 610 cases. Schauta (*Beiträge zur Casuistik, Prognose und Therapie der Extrauterin-gravidität*, Prag, 1891) found nine lithopedions among 626 cases, or 1.5 per cent.

CASES FROM 1900-1911.

Taking up the subject where Strauss left it, I have reviewed the cases published from 1900, inclusive, to the present time. No attempt has been made to classify the cases according to manner of calcification, that is, as true lithopedion, lithokelyphos, and lithokelyphopedion.

1. Hennig (*Centrbl. f. Gyn.*, No. 5, p. 159, 1900): Presented before the Obstetrical Society, Leipzig, November 20, 1899. Lithopedion, intrauterine. No details.

2. Bryant (*Guy's Hospital Reports*, vol. IV, 1901): Acute intestinal occlusion, through adhesion of intestinal coils with a lithopedion, found at autopsy, Carrier, thirty-seven years of age. Lithopedion size of a five months' pregnancy. Knuckles of small intestine were adherent to the lithopedion in two localities.

3. Slajiner (*Centrbl. f. Gyn.*, No. 22, 1901): Carrier, thirty-one years of age. According to the history and local findings the diagnosis was extrauterine pregnancy, with dead fetus. Laparotomy. Fetus found to be covered with omentum, forming some adhesions. Attached to placenta only by sclerotic umbilical cord. Fetus of male sex. The entire skin looked as if it had been tanned, while the body was fairly well rounded throughout. In several places the skin presented yellowish-white streaks, which were shown microscopically to be deposits of lime in and under the skin. Small calcium deposits were found in the adhesions, and at the points where these had been situated. The superficial skin layers were unchanged, but the deeper layers, especially the subcutaneous cellular tissue, presented numerous heaps of granular lime, which yielded the typical microchemical reactions. The outer subcutaneous cellular tissue contained numerous fat crystals. The muscular layer showed no microscopical changes.

4. Roster (*Centrbl. f. Gyn.*, No. 28, 1901, page 823; also *Trans. Toscana Obstetrico-Gynecol. Soc.*, Florence, meeting, June 6, 1901): Presentation of radiograph of a case of lithopedion.

5. Van der Linder (*Jour. d'Accouchement*, No. 38, 1902; also *Jour. de Chir. et Annual d. l. Soc. Belge de Chir.*, No. 11, 1902): Lithopedion, corresponding to the end of pregnancy, carried

nearly twenty-two years. It had entered the abdominal cavity through tubal rupture, and had here continued to develop. The woman had been treated at the time, twenty-two years ago, for abortion, but the fetus had not been found. During all these years her health was good until two years before, when she began to suffer from abdominal disturbances. Celiotomy was performed, revealing the lithopedion lying free between the coils of the intestine, and adherent to the omentum, with its entire right side. There was no trace of placenta, umbilical cord, or fetal membranes.

6. Kessler (*Gesellschaft, f. Geburtshilfe u. Gynaek.*, Berlin, meeting of February 14, 1902. *Centrlbl. f. Gyn.*, No. 13, 1902): Specimen of lithopedion demonstrated.

7. Amann (*Verhandlg. d. x. Versammlung d. dtsch. Ges. f. Gyn.*, Würzburg, June 3-6, 1903. *Centrlbl. f. Gyn.*, No. 27, 1903): Demonstrated, among other specimens, a lithopedion and a lithokelyphopedion.

8. Rosthorn (Heidelberg), at the same meeting (op. cit.), presented a specimen of *lithokelyphos interstitialis*.

9. Brewis (Edinburgh Obstetrical Society. *Scottish Med. and Surg. Jour.*, February, 1904): Demonstration of lithopedion, obtained at autopsy, which had remained forty-one years in the abdominal cavity.

10. Keitler (*Geburtshilf. Gynaekol. Gesellschaft*, Wien, meeting of November 10, 1903. *Centrlbl. f. gyn.*, No. 9, 1904): Demonstration of a fetal sac, with a mature fetus, which had been carried for twenty-two years, by a woman more than fifty-five years of age. Sac partly calcified—lithokelyphos.

11. Martin (*Ein Lithokelyphos*; inaugural Dissertation, Griefswald, 1904): Lithokelyphos, found at autopsy on a paralytic woman of seventy years of age. Size of ostrich egg. Inside the calcified sac was a well preserved fetus. The fetal parts contained no lime deposits.

12. Haultain (*A Case of Lithopedion Forty-one Years in the Abdominal Cavity.*—*Jour. of Obst. and Gyn. of the British Empire*, vol. vi, 1904): Patient, seventy-one years of age, was pregnant at the age of thirty, but had never been delivered of a child. The abdominal swelling remained for some years, then gradually diminished in size. She died suddenly of heart disease, and autopsy revealed a calcified fetus, to which the uterus, which was atrophied, was adherent. The normal configuration of the fetus was preserved to a remarkable degree. The tissues were contracted and calcareous on the limbs, but on the back, scalp, and breech they seemed of normal thickness.

13. Lumpe (*Monatschrift. f. Geb. u. Gyn.*, vol. xxii, 1905): The patient was a widow, sixty-four years of age, in whose case a tubal pregnancy, with rupture about the seventh month, and secondary abdominal pregnancy, with formation of a lithopedion, were successively removed by laparotomy. The fetus of seven months had entered the abdominal cavity, leaving not only the

pregnant tube, but also the fetal membranes. This pregnancy dated about twenty-five years back. The right tube, and both ovaries, were normal in proportion to the age.

14. Bürger (Vienna Obstetrical and Gynecological Society, meeting of November 8, 1904. *Centrbl. f. Gyn.*, No. 19, 1905): During operation for cervical cancer by means of the modified vaginal method, the right adnexa were found to be embedded in extensive adhesions, in the midst of which could be palpated a small hard body. This proved to be a lithopedion. There was nothing in the patient's history to suggest an old tubal pregnancy, though it was supposed that this had occurred.

15. Herlitzka (*Centrbl. f. Gyn.*, No. 39, 1905): The patient, forty-four years of age, gave a history of eleven pregnancies, including four abortions. The last confinement was four years ago. For two years she had noticed a resistance in the lower left side of the abdomen, which at first caused no disturbance, but later gave rise to slight pain. Examination by palpation demonstrated a tumor of stony hardness, the size of the hand, in the left iliac fossa. The diagnosis, by exclusion, was made of old tubal pregnancy, with mummified fetus. This was confirmed by laparotomy. The extirpated fetus proved to be a true lithopedion.

16. Fothergill (North of England Obstetrical and Gynecological Society, meeting of November 17, 1905. *Jour. of Obst. and Gyn. of the British Empire*, ix, 1906, page 67): Lithopedion, successfully removed from a patient thirty-five years of age. The left tube showed no definite sign of having been ruptured, but its surface was roughened by the remains of adhesions separated during the operation. The specimen was found to consist of the bones of a fetus of about five months, compacted into a rounded mass and to some extent infiltrated with calcareous salts. It was partially covered by a thin, more or less calcified, membrane. The ribs, scapulæ, iliac bones, and the long bones of the limbs were easily recognized. This pregnancy had ended seven years previously.

17. Beede, S. C. (*Surg., Gyn. and Obst.*, September, 1906, page 374): Lithopedion, removed from a woman fifty years of age, who gave a history of pregnancy dating back more than nineteen years.

(Beede, believing that some estimate of the frequency of this condition would be of interest, addressed letters of inquiry to fifty representative Western surgeons. Forty replies were received, reporting in all eighteen cases. Only twelve of these were undoubted cases of lithopedion, the others being macerated products, or of uncertain origin. Of these twelve, four had developed to term, one to eight months, one to six months, one to four months, three to two or two and a half months, and two not stated. Two had remained in the abdomen twelve years; as to the others, the time was unknown or not stated.)

18. Wallart (*Zeitschrift f. Geb. u. Gyn.*, vol. lix, H. 2, 1907):

Lithopedion, found at autopsy of woman eighty-five years of age. It was free in the abdominal cavity, where many adhesions had formed with the omentum and a coil of intestine. The age of the calcified fetus corresponded to the fifth month. No anamnesis was obtainable, but if the cessation of the menstrual periods is assumed to have occurred at the age of forty-five, the presumptive age of the lithopedion must have been at least forty years. Changes at the left tubal end, and especially the absence of recognizable portions of the left ovary, suggested a tubo-ovarian pregnancy.

19. Falk (Berlin), (*Centrlbl. f. Gyn.*, No. 43, 1907, page 1308): Lithopedion from an ovarian pregnancy. The specimen was not obtained at operation, but at the autopsy of a woman seventy-five years of age, who had carried the lithopedion for about thirty years, during which time she had given birth to a child at term. The diagnosis had been made long before, but the patient had never consented to an operation. The specimen showed the right ovary transformed into a tumor the size of a man's head, with deposits of calcium in the walls. The right tube was perfectly free and visible as far as the fimbriated end in front of the tumor; behind the tube, the ovarian ligament passed close to the tumor. In cross-section, a child nearly at term was seen in a crouched position, a little to the middle line. The head, vertebral column, extremities, viscera, female genitals, placenta, and umbilical cord, were all plainly visible.

20. v. Holst (*Centrlbl. f. Gyn.*, No. 15, also No. 34, 1907): Lithopedion, obtained by laparotomy, from a woman, who had carried it for six years. The patient recovered from the operation. The structure, position, and size of the various skeletal parts could be very distinctly seen on radiographs. The tumor occupied the fimbriated end of the left tube, and was markedly adherent to the pelvic floor. The specimen was analyzed and examined microscopically. The sternum was found to be entirely cartilaginous; the vertebral column consisted of numerous pieces of cartilage and bone. It was noteworthy that the cells still took in part a very good stain, in the vertebral bones and cartilages. Evidently these cells still survived, and the bone-formation from cartilage was not yet entirely completed. Instead of bone-marrow, there was an entirely fibrous connective-tissue, which was probably developed from the preserved endosteum, whereas the free marrow-cells had entirely disappeared.

21. Hayd, H. E. (*Am. Jour. of Obst.*, vol. lvi, 1907, page 657): Lithopedion or lithokelyphopedion, twenty-two years old, successfully removed from a woman sixty-four years and seven months of age. Reported before the American Association of Obstetricians and Gynecologists, September 17-19, 1907. The abdominal tumor, which the patient had carried for many years without inconvenience, had to be removed on account of progressive weakness, severe pains, and a bad general condition. On operation a stony mass weighing over two pounds

was shelled out of the left broad ligament, without any bleeding, and the patient made a good recovery from the operation, but died a few weeks later from pleurisy. There was a history of pregnancy and missed labor when the patient was thirty-five years old. The specimen was globular in shape, surrounded by a dense hard covering about as thick as thin cardboard. After sawing through the outer envelope the fetus was seen firmly bent upon itself, with the arms and legs like flattened bands. The calcified membrane was firmly adherent to the head and spine and back of the legs and arms. The abdomen, chest, side of head, arms, legs, and fingers, even the fingernails, were in perfect preservation.

22. Elbrecht, in discussing the above case, reported a case of tubal abortion, with complete detachment of the fetus from the placenta at six months, resulting in omental attachment and beginning lithopedion.

23. Price, in discussing the same paper, recalled a large specimen of this nature, with a foot protruding from the sac.

24. Morehouse and Griswold (*Jour. Am. Med. Asso.*, January 19, 1907, page 222): Lithopedion, carried twenty-six years or more, patient sixty-two years of age. Removed by laparotomy. The specimen was a complete skeleton of a fetus of five or six months, flexed on itself, complete in every respect, even to the preservation of the bones of the hands. The specimen is now in the museum of Rush Medical College.

25. Weibel (*Centrlbl. f. Gyn.*, No. 37, 1908, page 1227): Lithopedion after ovarian pregnancy; obtained from a woman fifty-seven years of age. History of extra-uterine pregnancy twenty-seven years before. Laparotomy, on account of hard, immovable tumor, size of man's head, in left half of abdomen. The specimen consisted of the placenta, the very well preserved nine months' fetus, and the closely adherent membranes. Deposits of lime were demonstrated in individual organs (liver, kidney, lungs, muscle and skin), being absent from others.

26. Smith, J. W. (*Jour. Obst. and Gyn. of the British Empire*, March, 1908, page 180): Lithopedion, retained in abdominal cavity for fifteen years and a half, after rupture of a tubal pregnancy at the end of the sixth week. Carrier forty years of age. The presence of the lithopedion resulted in acute intestinal obstruction. The patient died some hours after removal of the generally adherent lithopedion and relief of the intestinal obstruction. The specimen weighed one pound and five ounces, the whole being hard and calcified. The placenta, though calcareous, was not very hard, and at more than one point there was a tendency to crumbling. The survival and calcification of the placenta appears to be of rare occurrence, as in many of the recorded cases of lithopedion no mention is made of traces of the placenta having been found.

27. Staniszewski (*Centrlbl. f. Gyn.*, No. 48, 1909, page 1646): Lithopedion, removed by operation, demonstrated before the

gynecological meeting of the Warsaw Medical Society, November 27, 1908.

28. Schauta (*Centrbl. f. Gyn.*, No. 29, 1909, page 1023): Lithokelyphos, removed by operation from a patient thirty-three years of age, who gave a history of seven confinements. The disturbance which led to operation began eighteen months before, at which time the patient failed to menstruate, and considered herself pregnant. In the fifth month she felt distinct fetal movements, and finally neared the time of full term. About this time she fell on the staircase, and had labor-pains, with much discharge of water from the vagina. Five weeks later a membrane was passed from the uterus. The abdomen retained the same circumference, but seemed to become progressively harder. The patient then remained free from symptoms for four months. After fifteen months the periods returned. The specimen in this case is noteworthy for the reason that the intrinsic portion of the tube is entirely undeveloped, so that the pregnancy actually originated from the ampullary portion of the tube. The ovary was not involved in the formation of the capsule. The capsule, examined microscopically, showed infiltration with lime-salts. (Sections of this were projected upon the board at the meeting of the Vienna Obstetrical and Gynecological Society, March 2, 1909.)

29. Balfour (*British Medical Journal*, No. 2, 1909, page 1615); also *Jour. of Obst. and Gyn. of the British Empire*, Vol. xvii, 1910, page 247): Lithopedion, removed by operation, from a Hindu woman, thirty-two years of age, who had carried it three years. The specimen consisted of a nearly calcified fetus, nine inches in length, attached by long adhesions to the omentum and anterior abdominal wall. There were no remains of placenta. The patient made an excellent recovery from the operation.

30. Hall (*Jour. Obst. and Gyn. of the British Empire*, xvi, 2, 1909; *Lancet*, i, 1909, page 1380): Lithokelyphos, removed by operation from a woman forty-five years of age. She had been married twenty-one years, had had no children, but gave a typical history of ruptured tubal pregnancy soon after marriage, when the tumor for which she was operated appeared. The tumor was found to be a calcified spherical mass, as large as a child's head, which, on section, proved to be a perfect fetus encased in a calcareous shell.

31. Schuhl (*L'Obstetrique*, xiv, 1909, page 222): Lithopedion retained nearly twenty-seven years, carrier fifty-five years of age. In spite of the retention of this seventh months, calcified fetus the patient had four normal uterine pregnancies, the first of which was a forceps delivery, the others terminating spontaneously. (This observation was published, after the first of these confinements, in Schuhl's *These de Nancy*, 1883.)

32. Van der Veer and McCabe (*Albany Medical Annals*, No. 4, 1910): Lithopedion, autopsy findings; carried thirty-five

years; carrier, sixty-five years of age. Lithopedion entirely free in abdominal cavity, except for slight adhesions of intestine and peritoneum. There was one normal childbirth three years before the pregnancy corresponding to the lithopedion, and another three years later. The diagnosis was made in this case in 1909, by Dr. McCabe, and consent obtained to perform an autopsy when occasion offered.

33. Weidlich (*Centrbl. f. Gyn.*, No. 20, 1910): Lithopedion, in the urinary bladder, of patient forty-three years of age. The patient had missed her menstrual periods during five months, six years before. She suddenly became ill with very severe colicky pains and fainting spells, and was treated for several months for peritonitis. Severe gastritis, with intolerable colicky pains for a year past, undoubtedly due to a tumor, the size of a nut, which projected into the bladder. The bladder was opened by way of the vagina, when the diagnosis of lithopedion was rendered possible by the removal of the skull bones. In the midst of the work the small bones slipped away from the finger, and disappeared into a hole. Laparotomy was performed, under the assumption that the bladder had been perforated. It was found that a coil of small intestine communicated with the bladder, the lithopedion being contained partly in the bladder and partly in the intestine. Healing took place, and the patient made a perfect recovery.

34. Fraenkel (*Centrbl. f. Gyn.*, No. 35, 1910, page 1169): Lithopedion. A twelve to fourteen weeks' fetus escaped, with the placenta, into the abdominal cavity, where it remained for over one year. They were found to be closely adherent to the intestine and the omentum, with abundant new formation of blood-vessels, the fetus itself having become transformed into a true lithopedion.

35. Martin (*Annals of Surgery*, August, 1911): Lithopedion. Reported before the New York Surgical Society, April 12, 1911. The patient, thirty-nine years of age, had been a widow four and a half years. During the last year of her husband's life she believed herself to be pregnant, and at the end of the fourth month took measures to terminate the pregnancy by the introduction of a stylet and the injection of kerosene into the uterus. Moderate hemorrhage followed. Since that time she had had attacks of pelvic pain, which had recently become more severe. Upon vaginal examination a hard mass could be felt in the posterior culdesac. X-ray examination showed an indistinct shadow low down in the pelvis. Laparotomy revealed a hard mass, the size of an orange, on the right side, adherent to the uterus, which was normal in size. This tumor was composed of an adenomatous mass and the skeleton of a fetus, apparently of the fourth month. The fetus had apparently been in the abdominal cavity for four years.

36. Bainbridge.

34 GRAMERCY PARK.

REMARKS ON TEACHING OBSTETRICS.¹

BY

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THE teaching of obstetrics in the United States has in past years been so inadequate that the graduates of the greater number of our medical schools have entered into practice with little or no clinical experience in this most responsible branch of Medicine; a number of these incompetents made up this deficiency in their medical education by serving as internes in maternity hospitals, or by taking postgraduate courses at one of the few medical centers in the United States, which were equipped for this work, and a select few went abroad for their obstetrical training.

At present conditions are rapidly changing for the better; and in every state of the Union the medical schools, either from their own desire for advancement, or because they are forced to do so by state boards of health, are making honest attempts to give their students bedside instruction in obstetrics.

The difficulties which most of these schools experience in attempting this change from the time-honored didactic lectures to bedside and laboratory instruction, are so great and, at the same time, so little appreciated by those who have not worked under similar conditions, that a short description of the evolution of the teaching of obstetrics in the Washington University Medical School and of the manner in which this teaching has been carried on during the last few years, may be a help to some of those who are at present confronted by the same problems.

For the successful teaching of obstetrics four things are absolutely necessary—namely, qualified teachers, well prepared students, reasonable place and space in the curriculum and the necessary equipment.

1. *Qualified Teachers*.—The best qualification for a teacher and the one which should be insisted upon wherever possible, is that he has served a thorough apprenticeship in the practice and in the teaching of Obstetrics in a teaching institution.

2. *Well Prepared Students*.—Medical students in the United

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

States are rapidly improving in quality; in any school with average entrance requirements and with thorough courses in the ordinary subjects of the first two years the student who has successfully passed these courses is ready for obstetrical instruction.

3. *Reasonable Place and Space in the Curriculum.*—The curriculum of most medical schools is overcrowded; this is especially the case where students are still allowed to enter the school without credit in chemistry, physics and biology; these subjects must become entrance requirements, so that the first two years can be devoted entirely to anatomy, embryology, physiology, pathology, bacteriology and other subjects usually taught during the first two years, thereby leaving the last two years almost exclusively for clinical medicine.

In these two years the students must be prepared for the work of the general practitioner which consists mainly in the treatment of medical cases, in minor surgery and in obstetrics and, therefore, medicine, surgery and obstetrics must be given enough time for thorough instruction, while the undergraduate instruction in the various specialties should be limited. Obstetrical teaching differs from the teaching of any other branch of medicine in this, that in the entire scope of obstetrical work, there is not one chapter which might be safely omitted from the teaching of undergraduates; the youngest practitioner will be confronted by cases of placenta previa, eclampsia and other complications, at times and in places which make it impossible to call in more experienced colleagues, or to consult a text-book; he must be prepared to meet these emergencies without a moment's notice, else the two lives which are at stake in every case of confinement may be lost.

Instruction in obstetrics should begin with the junior year and continue to the time of graduation. Sixty hours during the third year and one hundred and twenty hours during the fourth year, that is to say, one hundred and eighty hours exclusive of the time spent in delivering women and in watching them during the lying-in state, is a fair arrangement, which cannot be much reduced in hours without impairing the efficiency of the instruction.

4. *The Necessary Equipment.*—A good example of the most desirable equipment is the modern Frauenklinik as we find it in connection with German universities; such a clinic has its maternity department with an outclinic service; it has its clinical labora-

tory; its department library; its historical collection of instruments; its museum of pelves and specimens, and a liberal supply of manikins, models and other teaching apparatus; it has also its gynecological department and is splendidly equipped for graduate teaching and for investigation and research; it enjoys, likewise, a liberal annual appropriation.

It is well for us to strive after such ideal conditions and to gather hope from the fact that many of the most renowned schools of obstetrics in Europe had a small beginning.

The minimum obstetrical equipment which to-day ought to be required of every medical school should be about as follows:

A. Control of sufficient obstetrical material to make it possible for every member of the senior class to receive a reasonable training in the examination of pregnant women. To be present and to assist at the delivery of at least five women and personally to deliver under an instructor not less than two cases, so that for a senior class of fifty the school should furnish a minimum of 100 confinements a year.

B. Equipment for a thorough manikin course.

C. A small, but well selected collection of specimens, pelves and teaching apparatus.

D. A clinical laboratory.

E. A small working library consisting of a few text-books and laboratory guides.

EVOLUTION OF OBSTETRICAL TEACHING IN WASHINGTON UNIVERSITY.

In 1899 the Medical Department of Washington University, formerly the St. Louis Medical College, was merged with the Missouri Medical College and this consolidated school is now known as the Washington University Medical School.

I was made professor of obstetrics and the department was turned over to me; the equipment consisted of two old manikins, two broken dolls and the semblance of an outclinic, which had been running two or three years without being able to get a proper start. It was located in a small room on the second floor of the college building, which had been furnished so that a student and a dispensary physician could sleep in it and attend on obstetrical cases to which they might be called; a meager obstetrical satchel had been furnished and the college janitors had taken care of the room. The outclinic physician was appointed from the graduating class each year, he did the best

he could and the next year turned the place over to his successor, who had to start all over again; a small endowment which the school had received provided an annual income of \$480.00 to pay this physician, whose expense for meals, laundry and car-fare consumed all or nearly all of this \$40.00 per month; the clinical material never exceeded twenty-five cases a year, and it served principally for the self-training of the outclinic physician.

Since that time the clinical material has increased from year to year, so that during the fiscal year 1910-1911 the 500 mark has been passed and the steady growth bids fair to continue. The class of thirty-three seniors, who were graduated in June, 1911, had personally delivered under supervision of qualified instructors 418 cases at term, and they had witnessed over 100 additional cases for which they received no individual credit; these were in great part complicated cases, which were delivered before sections of the class, including forceps-cases, breech and face presentations; cases of placenta previa and of eclampsia, and also two pubiotomies and three Cesarean sections. Thus every member of the senior class had delivered an average of twelve cases and had been present at the delivery of several times that number.

Let us now consider how this change was brought about and point out that part of my experience which may be a help to those who are facing the same problems.

When I took charge of the teaching of obstetrics under the conditions mentioned, I saw the opportunity for which I had been waiting and for which I had prepared myself in a five years' apprenticeship to Prof. Kehrer, of Heidelberg—namely, the opportunity of establishing a "School of Obstetrics."

The first thing to do was to put the outclinic in perfect running order. The janitors of the college had failed to keep the outclinic room in habitable condition; students and assistants alike were disinclined to occupy it; so I put the case before my wife. She at once rectified conditions by having the furniture destroyed; by having the wall-paper removed; by having the room disinfected and calsomined; by having it refurnished with sanitary furniture and by sending a woman around once a week to give the room a thorough cleaning; this woman was likewise to take bed-sheets, pillowslips and blankets to her own home for washing. Mrs. Schwarz also established telephone-service at her expense and furnished new and well equipped obstetrical satchels, and she continued to care for this outclinic until July, 1910, when

this clinic was removed to the Washington University Hospital, and the University assumed the financial responsibility.

The next step consisted in providing skilled obstetrical service for the outclinic patients. This was done by establishing a system by which the service of each assistant was extended to two years; during his junior year he was to receive a thorough training in obstetrics, so that in his senior year he should be able to take reasonable care of the outclinic and to act as instructor to his junior, so that my own activity in the outclinic might be limited to a general supervision and to the handling of special complications; this means, that we started out with one paid assistant, and that during the first year it was necessary for me to be present at as many cases as possible, and to act as bedside instructor to both assistant and student and that with the beginning of the second year a second assistant was installed, the junior residing in the outclinic room, and the senior being provided with quarters nearby.

Next it became necessary to provide real dispensary facilities, that is to say, a place, in which pregnant women may be conveniently examined and registered, and to which they can return after delivery for a final examination. This was an easy matter, because I had been conducting a gynecological dispensary in the basement of the college-building, and all that was necessary was to encourage the obstetrical cases to report at this place. Here sections of senior students received a thorough training in the examination of pregnant women; including pelvimetry; the latter, of course, could be practised on any of our patients.

The next step consisted in arranging lectures and recitations and in providing teaching apparatus. The old curriculum provided for two hours a week in the junior year and one hour a week in the senior year; these hours and the time spent by the seniors in the obstetrical dispensary and the obstetrical outclinic were sufficient for the start, especially because I had to do all the teaching myself until I had trained a few men for this work; the only addition which was made to this curriculum consisted in having the fourth part of the senior class come to my home every Saturday night, where from 8 to 10 o'clock were held quizzes and manikin courses, which were soon supplemented by lantern-slide illustrations. These Saturday evenings accomplished a good deal and the students were eager to attend; they were discontinued in 1905, after the epidiascope, which had been exhibited at the World's Fair by Zeiss of Jena, had

been installed in the college-building, and had become available for obstetrical teaching.

Some difficulties were encountered in securing the necessary teaching apparatus; natural female pelves and fetal skulls are to be bought only in small numbers and at very high prices; obstetrical manikins are likewise hard to get and still harder to keep in repairs. The greater part of my equipment came from two sources; from John Reynder & Co., 303 Fourth Avenue, New York, who at that time handled the "Aids in Obstetric Teaching," originated or referred to by J. C. Edgar. I secured "The Edgar Bronze Pelvis, mounted on Tripod" and "The Edgar Aluminum Cast of Sagittal Mesial Section of Bony Pelvis, Mounted on Blackboard and Tripod," and I have found both of excellent service and continue to use them; from the firm "Medicinisches Waarenhaus, No. 31 Karl Strasse, Berlin, N. W. 6," I secured leather dolls for the old manikins, which I had repaired and later on some new manikins after Schultze, the kind which I find the easiest to handle and the least expensive to keep in repairs.

The Berlin House proved especially satisfactory in providing certain models for teaching and in furnishing pelves and fetal skulls of Papiermaché, which are excellent substitutes for teaching purposes, most of these models are devised by Winternitz; special mention deserve plaster-of-Paris busts, eight in number, illustrating the configuration of the fetal head during its passage through the pelvis; a model on a stand illustrating the fetal circulation; another model showing a pregnant uterus of the second month to demonstrate the various layers of decidua; an excellent aid in teaching is the model by Zangemeister, demonstrating the passage of the fetal head through the vulva and the guarding of the perineum (received lately).

Of the Papiermaché imitations I have found those of fifteen abnormal female pelves of the collection in the Berlin Frauenklinik of especial value.

All this teaching apparatus and the collection of specimens which had been started, required room for safe keeping and this was hard to get; these things had to be distributed over the college buildings wherever space could be secured, and it is only since the concentration of the department in the Washington University Hospital, that they are properly cared for.

In the meantime the system worked satisfactorily; with each year the number of obstetrical cases increased and the number

of qualified teachers or consultants to the outclinic likewise increased; for in the first place several of the former assistants, after serving their term, remained as instructors in the department, and all of those, who located in St. Louis, are in friendly touch with the work of the clinic and can be pressed into service during any emergency.

In this way we worked for six years; we had no department laboratory and the library was represented by the most necessary text-books; but what we missed most was the absence of hospital facilities; complicated cases had to be attended at the home of the patient, and extreme cases had to be referred to city institutions, where we lost control over them, or they were sent to private hospitals and had to be paid for.

In 1905 the Medical School, recognizing the urgent need of some hospital facilities under absolute control of the school, established the Washington University Hospital in the buildings formerly occupied by the Missouri Medical College; enough space was given to my department to establish a delivery-room, a large obstetrical ward for white women; sleeping quarters for one assistant and several students, and a department laboratory; the outclinic still remained in the present college building, as did also most of the teaching apparatus, and obstetrical instruction was carried on at these two places.

In 1910 the Medical School began the reorganization which is still under way; for greater efficiency the entire department was concentrated in the Washington University Hospital, and it is now in a position to do reasonably good work until the new buildings which are contemplated will be ready for occupancy.

Obstetrics and gynecology form one harmonious and undividable department in the Washington University Medical School; this paper, however, deals only with the problem of teaching obstetrics, which offers many difficulties not found in the teaching of other branches of medicine, and which cannot be successfully carried on without a number of assistants and instructors, whose full time belongs to the department.

The present plan of instruction for undergraduates as outlined in the catalogue of the school has worked satisfactorily for three years and is as follows:

JUNIORS.

Obstetrics 1.—Demonstrations and recitations. This course covers the essentials of obstetrics and closely follows a text-book.

The students are given assigned reading. The course is illustrated by the epidiascope, specimens, models and charts. Two hours a week during the year—60 hours.

SENIORS.

Obstetrics 2.—Lectures and demonstrations on selected topics. Each one is complete in itself and treats of such subjects as placenta previa, eclampsia, etc., etc. They are illustrated in the best way possible and are freely discussed by and with the students, who have already practical clinical experience. One hour a week during the year—30 hours.

Obstetrics 3.—*a.* Actual work in the laboratory in examination of urine, blood, lochial secretions, chorionic villi, etc.

b. Bedside instruction in the examination of pregnant women, including thorough instruction in pelvimetry; studying the conditions, normal and pathological of the puerperal woman and of the new-born infant.

c. Manikin practice in the application of the forceps, management of breech presentations, versions, etc.

The senior class is divided into three sections; each section attends the Maternity Department of Washington University Hospital an hour and a half a day for a period of ten weeks. Every section is subdivided into three groups, each of which does the work as outlined, under a special instructor—75 hours.

Obstetrics 4.—The Washington University Hospital and out-clinic department furnish from 500 to 600 cases a year. Each student is assigned ten cases or more, which he visits during pregnancy, attends personally during delivery, and continues to visit during the lying-in state. All the work is done under the supervision of competent instructors, and the history of each case as furnished by the student is discussed in clinical conference—from the end of the junior year to the end of the senior year.

The department is likewise prepared to give graduate instruction.

440 NORTH NEWSTEAD AVENUE.

ASEPTIC OR ANTISEPTIC HANDS IN OBSTETRIC PRACTICE? WHICH AND WHY?¹

BY
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HERETOFORE, many men might have answered the above question in an off-hand, haphazard fashion and after answering they might have rested content and considered the matter settled for all time. The result of this would be practically the same, whether their guess was right or wrong; that is, the guesser if questioned would find himself at a loss to give a single good, practical and unassailable reason in support of the accuracy of his decision; after all he would only be guessing. Nor do I now know of any experiments, except my own, which tend to prove or disprove, one way or the other, any opinion which might be advanced by any one; even though the promulger deduced it solely from speculative or hypothetical premises which appear more or less probable. If there are dark spots of ignorance from which aseptic obstetrics may not yet have emerged perhaps this is the blackest. A very irreverent young medical fledgeling suggests that I call my paper the "Black Hand of Obstetrics." I would call it anything so that I drive home the fact that the matter is not trivial and that the circumstances seemed to justify me in endeavoring to try out the whole affair, to discover the actual facts, to discard all speculation and to get down to the bottom of things as they are. In so doing it has been necessary to make many cultures and blood-serum was commonly employed as the medium, although in case of doubt agar-agar was also of service. The results I give to you hoping that they may prove of some small interest and value.

The fact that most patients do not require a vaginal examination need only be mentioned and dismissed from consideration, inasmuch as this paper only deals with those in whom it is requisite. The question at issue not being the necessity of exploring the parturient canal with hand or finger, the sole point raised is, "Shall Asepsis or Antisepsis be employed and what are the good and logical grounds for our selection of one or

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

the other?" Discussion as to the need of the exploration might be interesting but it would carry us far from our theme.

As to the canal itself I carefully verified the generally accepted opinion that a normal vagina is generally germless and the usual vulva is germ-laden. Cultures taken from the latter did not invariably show pathogenic germs, but that is beside the mark, since our aim must be to have absolutely negative tests; because with absolute negation our protection is perfect, but if nonpathogenic germs sometimes appear then our protection against the pathogenic is slim indeed. In other words our asepsis and antiseptis must both be as complete as we can make them; therefore our test media must remain germless or negative after the probationary trial smear or stab.

The average parturient canal is a channel clean internally but contaminated externally; or it is a germ-laden opening leading to a sterile vagina. Admitting this state of affairs after the culture tubes and the incubating ovens had proved it to be correct, as applied to the average woman under average conditions and environment, I found, as might well be anticipated and foretold, that it was impossible to introduce a sterile glass rod or rubber-glove finger without carrying vulva-born germs into the vagina; nor was it possible to withdraw rod or finger uncontaminated. No antiseptic was used in vulvovaginal-tube so that the test of the hand should remain a clear issue. A common test of a rubber glove was to draw the boiled glove on a carefully cleansed hand, then obtain five control cultures from the fore-finger; after that introduce the finger into a vagina, withdraw it and make five other cultures from it; finally to separate the lips of the vulva and make five more trial cultures from the vaginal floor. The further conduct of the cultures showed that our asepsis had entirely broken down, and that now both the glove-finger, after withdrawal, and the vaginal floor yielded cultures of germs which were at first limited to the vulva; nor could I find that the conditions differed in any way whether an ordinary unboiled glove was picked up from the table and pulled on the examining hand or whether the carefully boiled glove was used. Perhaps the yeasts were a little more constant but even this is doubtful, and as I say there was practically no difference so far as I could discover. The great point, that was most impressive, was "Where is the profit in it all?" What is the use of all the trouble and care requisite to obtain asepsis if it is so easily nullified. So hard to obtain and so impossible to

maintain. Nay more, our manipulation had for its definite final result that we had contaminated the vagina with a mixed infective material carried in from the vulva. If my tests proved anything they proved that reliance on the aseptic hand simply made sure that conditions against which we strove to guard were made rather worse, unless the vulva was made rigidly aseptic also. A very few cultures convinced me thoroughly that a sterile vulva is rare indeed at least under any of the usual technics.

The vulvæ with which I experimented all showed good, vigorous, mixed cultures and were selected for that very reason. Because if a hand could be made sterile, and so maintained, the contact with a contaminated vulva was a good test of the power and permanency of a very desirable condition of affairs. How asepsis broke down, readily, under this trial has been shown above.

In order to show how ephemeris asepsis is, I made fifty tests of rubber gloves which were boiled twenty minutes, dipped in cool sterile water, to eliminate the heat factor, and laid on sterile china plates, all taking place in an ordinary room with the door and a window partly open. One test was positive after two minutes, all were positive after thirty-six minutes and the conclusion reached was that asepsis of an untouched, unhandled glove might possibly be relied on for five or ten minutes. If a pair of contaminated gloves were thrown into a boiler in the ordinary way, and allowed to float, then asepsis was frequently not obtained. I therefore took a round nutmeg grater (price ten cents), put the gloves inside that and dropped it in the sterilizer. It sank at once and its rough sides protected the gloves from coming in contact with the boiler or with any instruments which that boiler might contain. I usually use this in hospital and private work and medical friends think well of it as being just the thing they have been looking for, in the way of a glove-boiler.

To sum up the above seems to make but two inferences: 1. That there is small advantage in having a sterile glove to pass through a germ-laden vulva. 2. The very fact that the glove is aseptic makes it particularly favorable as a carrier of pure cultures of certain germs (for example, the gonococcus), the growth of which might be interfered with by the so-called "overgrowth" when a contaminated glove was used. That is, full development of a weaker germ might be impeded by ad-

mixture with another germ of sturdier growth, an advantage which will appeal more to the bacteriologist than to the accoucheur.

You will have noticed that in speaking of asepsis reference has been made almost exclusively to the gloved hand or finger. This has been done because the glove is generally considered to have an advantage over the bare hand and I wished to present asepsis at its best. I use gloves, personally, because I have brought my bare finger in contact with a chancre of the cervix on two occasions. Nothing happened but there were possibilities which were not pleasant to contemplate. Aside from their protection to me I can find no special advantage or disadvantage in the use of rubber gloves. They have come to stay, or so I believe, but I also believe that both their advantages and disadvantages have been exaggerated. Possibly it is easier to boil a pair of gloves, draw them on and diminish the tactile sensibility $1/2$ of 1 per cent., than it is to sterilize the hand in any other way. But this does not free us from the necessity of carefully preparing the hand on which these gloves are drawn. If there is any advantage let it lay in favor of the aseptic hand and let me narrate briefly my experience with the natural, ungloved but antiseptic one. The antiseptic named shall be chlorinated lime. There are other and possibly better ones but this is simple, well-known, easily obtained and quite sufficient for a good contrast of the aseptic with the antiseptic hand in accouchment.

Suppose the hand cleansed; suppose lime and soda used as usual until the hand is perfectly clean, and suppose some additional lime is applied to the wet hand, worked up into a paste and allowed to remain, then that hand should have been by turns clean, antiseptic, aseptic and is now antiseptic again. Whereas the aseptic is neutral or passive, the antiseptic, bearing a germicide, is a weapon. Furthermore, while the asepsis may, or may not, be maintained for a few minutes I once, for test purposes, kept my hands antiseptic, sterile and practically germ-proof for twelve hours—when the test ended. How much longer I could have maintained the condition of course I do not know but could see no reason against indefinite continuance, except personal fatigue. Now it is well known that chlorinated lime is an irritant; but like most of irritants of what may be broadly termed "medium intensity" the severity of its action and its consequences depend largely on continued or repeated contact. For instance, one's hands would hardly be made sore by applying

it on Monday (say) even though they might be very painful and eczematous if it were used on Monday, Tuesday, and Wednesday. Therefore after a few tentative trials I had small hesitation in introducing my finger into the vagina even when that finger was well smeared with the pasty lime. Nor was I surprised when the patient assured me that it was not uncomfortable. But, mark the difference, whereas the gloved aseptic finger practically always gave positive cultures, after its introduction and withdrawal, and whereas the once sterile vagina was contaminated and gave also positive cultures; now neither the finger nor the vagina yielded anything but negatives under proper technic. If the accoucheur prefers to use gloves does it not seem that even then the antiseptic glove is preferable to the aseptic and for the very reason given above, viz., that antisepsis is active in the patient's defense while asepsis is merely passive and difficult to maintain.

SUMMARY.

The vagina is a sterile canal and to reach it we pass through a contaminated ring, the vulva. To do this by introducing an aseptic finger means contamination of both finger and canal. To introduce an antiseptic finger means the contamination of neither. Therefore the antiseptic finger or hand is the best for obstetric purposes.

I have simply given the results of my experiments without loading down a little paper with statistics, but every step of my experimentation has been careful and painstaking; and may be readily duplicated.

128 WEST EIGHTY-SIXTH STREET.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

(Concluded.)

Dr. LEWIS GREGORY COLE, of New York City, read a paper on a
RADIOGRAPHIC STUDY OF MOTOR PHENOMENA OF THE PYLORIC END
OF THE STOMACH AND DUODENUM WITH A VIEW TO THE
EARLY DIAGNOSIS OF CARCINOMA, ULCERS AND ADHE-
SIONS IN THIS REGION, ILLUSTRATED BY LANTERN
SLIDES AND CINEMATOGRAPHIC FILMS.

of which the following is an abstract:

This paper is the second of a series on "The Radiographic Diagnosis of Gastric and Duodenal Lesions." The first of the series described the different types of unobstructed gastric peristalsis, and the systole and diastole of the stomach, and I cannot refrain from giving the salient points of the preceding article, for it would be exceedingly difficult for one to understand the motor phenomena of the pylorus without understanding the motor phenomena of the remaining portion of the stomach.

First we will consider the various types of stomach regardless of the motor phenomena. These are: text-book, cow-horn, fish-hook, and drain-trap. This last type may not be normal.

We will now consider the various types of gastric motor phenomena and the systole and diastole of the stomach. These vary with the number of peristaltic contractions that are in the stomach at a given time, and there may be from one to six contractions—usually four—originating in the body or in the fundus and moving pyloricward. In addition to this there is a contraction and relaxation of the stomach as a whole which is best described as the systole and diastole. These are all fully described in an article which will be published in the *Archives of the Roentgen Ray*. Having briefly considered these, we will skip the pylorus and duodenum and consider the ileum and jejunum which, radiographically, is an unexplored field. The ileum is identified by the coagulated appearance of the bismuth and the jejunum is identified by the flocculent appearance. The second and third portions of the duodenum are usually readily identified by their shape and position unless the peristalsis is so active that it sucks the food away from the pyloric sphincter more rapidly than it is allowed to pass through. In such cases I have pursued a method which will probably be applicable in many others, described as follows:

The patient swallows an Einhorn pyloric dilator. This is a

small ball attached to a very small rubber tube, and near the ball is a small rubber bag which collapses around the tube just behind the ball. This is as easily swallowed as the ordinary "old-fashioned pill," and with the patient in a certain position, it will readily pass into the duodenum and jejunum. The small rubber bag is then inflated through the tube and acts as an intestinal obstruction. Bismuth and buttermilk is then given by the mouth and passes rapidly into the duodenum, which dilates, giving its contour perfectly, and if it is bound down by adhesions, such points show, as they do not dilate. I am having this apparatus modified so that the solution may be injected and evacuated from the duodenum through another small tube. This will allow of diminishing or increasing the amount of fluid in the duodenum at will.

Dr. Crane of Kalamazoo called attention to the fact that the size of the head of the pancreas could be determined by the size of the duodenum. The canal of Wirsung, which in this case is dilated near the center of the head of the pancreas, is readily discernible.

The first portion of the duodenum deserves special attention. Anatomically and physiologically it has always been considered a part of the small intestine but in reality I believe that it should be considered part of the stomach. This portion of the duodenum is usually dilated into a triangular cap, whose motor phenomena corresponds with the gastric cycle rather than the peristaltic action of the remaining portion of the duodenum. This is separated from the pyloric end of the stomach by a space of $\frac{3}{16}$ of an inch, which indicates the normal pyloric sphincter. Both sides of the sphincter should be clear-cut and well defined during the stage of systole of the stomach.

We will now consider the motility and relation of the pyloric sphincter. The pyloric sphincter enjoys a moderate degree of motility, as only the second portion of the duodenum is held down by the peritoneum. In many cases, however, this motility is increased by a stretching of the gastrohepatic ligament and the first portion of the duodenum. In other cases the pylorus is bound down by adhesions so as not to allow the slightest movement. The relation of the pylorus with the umbilicus varies with the type, size and shape of the stomach; the umbilicus also varies. The relation of the pylorus to the body of the stomach is much more important. But the most important question is the relation of the level of the food to the pylorus when the patient is in the erect posture. If the food is three, four or five inches below the pyloric sphincter and there are no peristaltic contractions, how is the food going to get out?

Dr. Crane of Kalamazoo has called attention to the relation of a local point of tenderness, or pain, on the abdomen, to an ulcer of the stomach or duodenum.

The following cases, which are briefly described in this résumé, were illustrated with lantern slides, but considering that this is

only a résumé it was not deemed advisable to attempt to illustrate it with half-tone cuts.

The first three showed extreme cases of carcinoma unrecognized by competent diagnosticians: these were to illustrate the gap in diagnosis between the immediate past and the present.

The next one was a radiograph of a small annular growth at the pyloric end of the stomach verified by operation, but on account of the absence of glandular involvement it was considered benign.

A radiograph of a pathological specimen, which proved to be annular carcinoma, was then shown and attention called to the similarity between this one and the previous radiograph.

The next slide showed an unusually early carcinoma before the patient was fairly in the grip of the deadly enemy.

The diagnosis of gastric carcinoma in an early stage has recently been the height of the ambition of the radiologist, but this is now accomplished and, in a very large percentage of cases, he is justified in either making a negative diagnosis of carcinoma, or stating with certainty that there is some lesion either benign or malignant that requires immediate operative procedure.

The next group of slides illustrated adhesions involving the pylorus and the duodenum. This is a group of cases which Dr. Morris called to our attention in 1905, under the heading of "gall-spider lesions or cob-webs in the attic." In many of these cases I believe the adhesions are due to unrecognized ulcers of the pylorus or duodenum rather than of gall bladder infection. Radiographically we cannot always state the etiology of these adhesions, but there are some distinguishing features which are fully described in the complete paper.

Part of these cases require surgical procedure; part of them show definite lesions radiographically, but without sufficient symptoms to justify surgical procedure. By far the most important group are the border-line cases where there are definite radiographic findings with obscure, indefinite, but prolonged symptoms referable to the upper part of the abdomen. These cases were illustrated by a number of lantern slides showing obstruction of the peristaltic contraction and the inability of the pyloric end of the stomach to expand when the food is pushed pyloricward by the peristaltic contraction. In some cases adhesions encircle the pylorus, in others they were limited to the first portion of the duodenum and the lesser curvature, and in others, the greater curvature, near the pyloric end of the stomach. The differentiation between adhesions and carcinoma was also described.

The last slide showed the very close relationship of the first portion of the duodenum to a group of gallstones which showed distinctly in the gallbladder.

The paper was then followed by a cinematographic demonstration of the various types of unobstructed peristalsis and also cases where the peristalsis was obstructed by carcinoma and adhesions from both gallbladder infection and ulcers.

THE RELATION OF GASTROCOLIC DISPLACEMENTS
TO CERTAIN INTRAPELVIC CONDITIONS IN WOMEN.¹

BY

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DISPLACEMENTS of the stomach and colon of long standing, and that have been almost uniformly overlooked, are of such frequent occurrence in my practice, and present themselves so often in connection with certain intrapelvic states in women, that I feel justified in bringing the subject to the attention of the Association. It is important, however, before taking up the clinical and pathological phase of the question that we should have a clear understanding of the normal position of the stomach and colon, concerning which there exists much misunderstanding, not, I am sure, in this audience, but in the wider audience that will probably be reached through the publication of this paper. It should be stated, too, that the misunderstanding to which I allude is directly traceable to the misleading points found in the older works on anatomy in which the stomach is depicted lying in a direct transverse position in the upper zone of the abdomen, while the colon is shown to define with geometric precision the three sides of a quadrangle corresponding to the two sides and upper extremity of the abdominal cavity. This misconception has, of course, been corrected, if it ever existed in the minds of all abdominal surgeons by their daily experience, and latterly in the minds of the general profession, or at least those members of it who have studied Cunningham's photographs from frozen subjects, or who have been so fortunate as to study anatomy as it is now taught in our more progressive medical schools. These studies establish the fact that, in the normal subject, the stomach lies obliquely across the abdomen, from the point of its esophageal attachment at the diaphragm, to a point in the right side of the abdominal cavity but slightly above the level of the umbilicus. The colon is found in the normal subject, especially when in the standing posture, to extend almost in a direct line from the ileocecal juncture in the right lower quadrant, obliquely upward and across to its rather firm and enduring fixation at its splenic flexure

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

in the left upper quadrant. In only a few cases have I found the so-called hepatic flexure presenting anything like the degree of angulation that would seem to entitle it to the designation of a flexure. It should be stated furthermore that deviations from the normal standard, such as I have outlined, may be very marked without any resulting functional disturbance that would seem to place such deviations in the pathologic category.

That there are, however, deviations from the normal in the position of the stomach and colon that do interfere with their functional integrity and with the functional integrity of other organs, especially those of the pelvis, is a matter of daily clinical demonstration. The stomach is not unfrequently found suspended from its esophageal attachment, hanging vertically in the left side of the abdomen, with its pylorus in the left iliac fossa, or, as sometimes occurs, in the culdesac of Douglas. In certain of these cases, the resulting angulation is in the stomach itself near the pylorus; in others, it is in the duodenum. The small intestines are less frequently, although sometimes, found in a state of marked decensus. The colon, however, is quite frequently shown to lie entirely in the lower zone of the abdomen, often kinked and reflected upon itself in such a way as necessarily to impede the fecal current and induce mischievous pressure upon all underlying organs and structures. In certain other cases, I have found the associated condition of some decensus of other organs, thus filling out the picture of general splanchnoptosis, or Glenard's disease. Thus there sometimes exists a displacement of either the liver or the kidneys, sometimes both combined; but, in the larger number of instances, these conditions exist independently rather than as complications of gastrocoloptosis.

The mechanical interference with (a) gastrointestinal function, (b) with the function of other organs, and (c) indirectly with the system in general, becomes apparent if we pause but for a moment to consider the factors involved in the problem. With the condition of stomach that I have described, there necessarily results an interference with the escape of ingesta into the duodenum, the decomposition of the retained stomach content, the perversion of the gastric secretion generally characterized by hyperchlorhydria, resulting not infrequently in the development of enteroptosis and the classic peptic ulcer. In a case referred to me by Dr. Greiwe, the patient had been the victim of *succurrhea gastrica*, necessitating the use of the stomach-tube twice and sometimes three times a day for years—a condition that disappeared immediately follow-

ing operation. The *x*-ray examination of these cases—something over forty of them—made by Dr. Sidney Lange, invariably show a marked retardation of the fecal current in the colon, the delay amounting at times to as much as forty hours in excess of the normal period. The hyperabsorption of material from the fecal content, and the resorption from the same medium of toxins once excreted by the liver, the mucous follicles of the intestines and other emunctories accounts in large measure for the toxemias, with resulting headaches and the general family of neurasthenic phenomena manifested in whole or in part by all of these cases. These neurotic symptoms are furthermore largely due to mechanical infringement on the various ganglia and plexuses of the sympathetic. The inferior mesenteric plexus, lying just at the juncture of the descending colon with the sigmoid, is so located that it cannot but receive a large proportion of the weight from the laden stomach and colon when displaced as I have indicated. The superior mesenteric plexus and the coeliac plexus with their numerous ganglia must necessarily be disturbed by the tension induced by even slight gastrocolic decensus. These mechanical disturbances of the sympathetic, resulting in more or less disturbance of its function as the controlling factor of the caliber of blood-vessels and of the hollow organs, is furthermore manifested through the autonomic filaments as superficial pain referred to one or the other quadrant, anteriorly or posteriorly, sometimes to more than one, especially the lower two, according to the ganglia or plexus more directly involved. I have repeatedly observed mechanical interference on the venous side of the mesenteric circulation, resulting in distention of the veins, suggestive of varicosities. This is also true of the gastric circulation. That this turgescence of the veins is due to the mechanical effect of the displacement is shown by the fact that I have seen it largely, if not entirely, disappear in the course of an operation, after the obstruction to the larger vein trunks had been removed by the replacement of the viscera. It is this state of venous congestion that, I am sure, is responsible for the severe pain about the cecum, and referred to McBurney's point that is so often taken as the early diagnostic sign of appendicitis. These are the cases that, prompted by the severity of the pain, its sudden onset and classic location, are hurried to the operating room, where an exploratory incision reveals the absence of any trouble in the appendix adequate to explain the symptoms. These are the cases that I have learned to designate as pseudo-

appendicitis. Their true condition is too frequently overlooked, even under exploratory incision, for the reason that with the patient in the delivery position, the stomach and intestines drop back to a relatively normal location, and even if the patient is in the horizontal position, the usual small incision will not enable the surgeon to determine the position of either of them.

It is not my intention in this brief communication to expand the foregoing general considerations into a discussion of gastrocoloptosis in its more general phases. I feel, however, that what I have already said, comprises a logical foundation for a consideration of the relation of these displacements to certain resulting intrapelvic states, particularly in women. These intrapelvic states may be summarized as follows, viz.:

1. *The Bladder*.—General irritability with diminished capacity, often resulting in incontinence of urine, especially at night. In multipara with enlarged vaginal outlet, the tendency to vesicocele is distinctly accentuated.

2. *The Uterus*.—There is a marked tendency of displacement, the inclination seeming to be greater in the direction of anteversion. The uterus in these cases is generally tender to the touch, and menstruation is ordinarily excessive, with more marked pain during the days of onset.

3. *The Ovaries*.—Ovarian pain is a frequent, but not constant, concomitant and the fact that the pain is ovarian is confirmed by tenderness of those organs in vaginal touch and on bimanual examination. In certain cases, the ovaries, one or both, can be felt in the culdesac.

4. *The General Pelvis*.—The general pelvic structures are tense, and impart to the examining finger the impression of a superimposed pressure. This superimposed pressure is felt at its maximum, when the patient is standing, and disappears when she is placed in the knee-chest posture.

In the absence of other and more obvious causes, it takes but little reasoning to connect the pelvic conditions that I have just mentioned with the gastrocolic decensus that I have previously described. It is evident that the intrapelvic disturbance may be effected through three, if not four, media: viz., (1) direct pressure, (2) venous engorgement, (3) sympathetic nerve disturbance, and (4) induced systemic states characterized more particularly by lowered blood states and general impairment of nutrition. The direct pressure may be considerable. I recall one case in which one of our ablest diagnosticians called me at nightfall to

operate for appendicitis. There had been a sudden onset of the severest pain in the ileocecal region; the tenderness over McBurney's point was so extreme that the patient screamed when she was touched in that locality; the muscular rigidity was marked; the patient had had a chill and there was a slight temperature reaction of possibly a degree. I, of course, at once confirmed the diagnosis, and we operated within the next two hours—only, however, to find a normal appendix. What we did find in addition to that was a colon, every convolution of which was laden with fecal matter, the entire gut looking much like the convoluted bologna sausage that one sees in the windows of the meat shops. The veins stood out on the colon, in the mesocolon, and in the omentum like quills, thus showing that the obstruction involved not only the mesenteric, but the gastroepiploic systems. This colon with its weighty content had been riding for years on an anteriorly displaced uterus, and on ovaries that had finally been goaded into such revolt that the patient was the victim of constant general pelvic distress, which was greatly aggravated by the approach of the menstrual period. In other cases, however, in which the demonstrated infringement of a less heavily laden colon on the pelvic organs was less than in the case just recited, the disturbance seemed to depend upon mechanical interference with the efferent circulation of the pelvis, while the disturbance of the sympathetic seemed to be responsible in a large measure for a neurosis that accentuated every pelvic pain of which the patient complained.

I have met several of these cases with a long history of stomach tubes, health resorts, curettages, uterosuspensions, hemorrhoidal excisions, divulsed sphincters, polytherapy, and, finally, that great panacea for otherwise incurable cases, travel. One of them, who was in my office only yesterday, and whose radiograph I show herewith, has exemplified precisely the history that I have outlined. I shall treat her as I am now treating all of these cases, by reposition and fixation of both the stomach and colon. I am happy to say that so far I have had no recurrence of these displacements, nor of the distressing symptoms that depend upon them. One case, sent me by Dr. Patterson of Brookville, Indiana, gave the history of a traumatic displacement of the stomach and colon, dating back eighteen years. She had had constant pelvic distress and constant constipation. Her bowels moved naturally the second day after operation; absolutely the first time such a thing had occurred in eighteen years, and the

pelvic pain, as well as the pain in her back, in the splenic region and in the lower right quadrant, in short, all of her pain has become a thing of the past.

Another patient, sent me by Dr. Greiwe of Cincinnati, and still another, sent me by Dr. Taylor of Maysville, Kentucky, have had a similar history, associated with a marked increase in weight. My final admonition here, to-day, is, keep the probability of gastroenteroptosis constantly in mind, and use it as your guide in the investigation of all cases of intractable pelvic pain, not explainable on any more obvious and plausible hypothesis.

THE GROTAN.

DISCUSSION ON THE PAPERS OF DRs. COLE AND REED.

DR. ROBERT T. MORRIS, New York City.—I do not know why nature's plan should give us knowledge slowly; but it is the same plan which dictates whether an oak tree shall grow to 80 feet in height in 200 years, or 500 feet in a night. For thousands of years appendicitis was treated as a medical disease; then doctors found out it was a surgical disease. Dyspepsia was formerly considered a medical disease, but now we are finding out that it is largely a surgical affection; at any rate, the symptoms frequently point to a surgical condition or conditions. Now, in this group of dyspepsias, we have to consider, first, the fact that motility is the chief function of the stomach; that anything which interferes with the motility of the stomach leads to a long series of changes in concatenation. The primitive area of the stomach developed from the fore-gut, the pylorus and duodenum are under the control of the internal secretions—the chromaffin group. Whenever we have interference with motility at this point particularly, there is disturbance in the local gland secretion. The hormones, which send messages to the secreting glands, are apparently changed in character, and we have a series of disturbances known as the various dyspepsias. These may be grouped in two large classifications. First, the one in which the interference is mechanical, adhesion and scars; mechanical interference allows of disturbance of the hormones, the messengers send wrong messages to the secreting glands. In the other large group we have the decadent patients, the neurasthenics. We must separate this group very distinctly from the one in which there is mechanical interference with motility of the stomach. In the decadent group we find very frequently the high arched palate, facial asymmetry, gun-stock scapula and other stigmata, and in many cases of dyspepsia it is important to note, first; if we have the stigmata of degeneracy, and if we have, we must ask if there is a corresponding disturbance of the sympathetic apparatus controlling the movements of stomach and bowels. In that case, I would like to ask Dr. Cole if he can determine whether an irregu-

lar peristalsis, belonging to the neurasthenic group, can be distinguished as such, and if it can be differentiated from the mechanical group of interferences. If so, another very important step forward has been made.

During the past year nearly all of my cases of dyspepsia have been subjected to fluoroscopic examination of the stomach with bismuth. It has helped to find incipient malignant disease among cases of ulcer, and many cases of the group which I described as cases of cobwebs in the attic of the abdomen which have been regularly overlooked, or which have been diagnosed as appendicitis, gallstones, ulcer of the stomach, or as many diagnoses as we formerly gave to appendicitis. It happens that in our anatomy, our physiology, we are subjected to marked toxic influences in the region of the bile tract, in the region of the pylorus and duodenum, and toxins escaping by excretion from the liver or by direct migration in this vicinity cause desquamation of the endothelium of the peritoneal side. When this endothelium desquamates, a plastic lymph exudes, in some cases adhesions form, and we have interference with the motility of the stomach or duodenum, including the pylorus. I am finding the colon bacillus as the apparent culprit in these cases. The work of Dr. Cole in bringing out this large group of cases will teach much about our dyspeptic patients. This new work of Dr. Cole's in determining the presence of such adhesions in this way is very important, as showing that we have interference with the motility of the stomach at that point. It gives us very definite testimony.

As to the question of diagnosis, Dr. Cole's method is one step nearer scientific accuracy.

To speak a moment of Dr. Reed's paper, we are dealing again largely with cases of ptosis, with the neurasthenic group of patients who have relaxation of the peritoneal supports. When we have relaxation of the peritoneal supports and various ptoses, a number of secondary changes takes place, the symptoms of which may become the dominant disturbing factors in the case. and if we relieve these we have done much to relieve the patient. But we have not relieved the underlying condition, and, according to Dr. Oliver Wendell Holmes, we should have gone back to the grand-parents. Again, neurasthenic patients are the ones who respond very promptly for a time to almost any operation, as well as they do to Christian science. It makes no difference what you do to them. They will respond to Christian science or to anything you may do for them. They are cured of their constipation and are relieved of various symptoms; they will gain from 15 to 20 pounds in weight, but after a year or two their neurasthenia will assert itself again and you have a long chain of symptoms. I must confess that I have done operations similar to those mentioned by Dr. Reed, in fact I was one of the first to shorten up relaxed peritoneal supports, beginning with the suspensory ligament of the liver, shortening the gastro-hepatic omentums and the gastro-colic ligament. While I have obtained

good results in some cases, yet I feel it was rather savage surgery, and of late I have been conservative and have recommended abdominal supporters and massage and traveling, and if these patients become too troublesome, I sent them on a trip around the world. (Laughter.) These patients need to be treated from the beginning with their grand-parents.

DR. G. S. HANES, Louisville, was asked to participate in the discussion. He said: I have done no work along the line indicated by Dr. Cole this evening, except to ascertain the possibility or probability of introducing flexible and nonflexible instruments and liquids into the upper limits of the large bowel. And also to estimate the capacity of the rectum and the entire large gut. I was convinced, after a number of radiographic pictures were made, that no instrument could be introduced through the rectum and sigmoid into the colon of the average individual. Later, I was convinced that instruments could not be introduced higher than the first half of the sigmoid. Soft rubber colon tubes usually coil in the rectum. I used bismuth in the liquids introduced. I was in doubt about bismuth passing to the cecum, as there was considerable confusion in the shadows of a long and well distended sigmoid with those of the other portions of the large gut. Dr. Bruce and I had to tax our imaginations very liberally as every radiographer must often do to arrive at definite conclusions. I believe Dr. Reed and Dr. Cole saw things to-night that were not clearly visible to many of us. Not being exactly satisfied with the outline we are able to get of the large gut, we made a number of beautiful pictures which showed all the divisions of the large bowel by introducing bismuth into the cecum through an appendicostomy opening. I believe this is the best method known whereby we may get a correct notion of position, angles, size, etc., of the large gut in the living individual.

If I understood Dr. Reed correctly, he stated that it was his observation that the hepatic flexure was rather obtuse. It was my observation that the hepatic angle was very acute, while the splenic flexure was even an exaggeration of the former condition and always situated at a higher level. My observation has also shown that the normal transverse colon is much more mobile than was hitherto supposed. Patients were placed in the direct horizontal position, then with the chest elevated and again with the hips elevated, with the result that the transverse colon occupied distinctly different positions in the abdomen in each case. The fact is the transverse colon and the sigmoid are the only divisions of the large gut that have mesenteries which allow extensive mobility. I feel sure that we have all had a more or less incorrect notion of the length of the sigmoid especially. I have removed the sigmoid from twenty-five cadavers, the shortest being 8 inches and the longest 28 inches. Not a great while since some one reported a sigmoid 44 inches in length. The average length of the sigmoid is now considered to be about 18 inches. Passing from above downward the sigmoid begins at the

inner border of the left psoas tendon and has its termination about the middle of the third sacral vertebra, the two extremities being about 3 or 4 inches apart. With a long sigmoid having its two ends so near the two extremities of the colon, we can see how easy it would be to confuse the shadow of a distended sigmoid with the remaining portion of the colon. It should always be borne in mind that the mobility of the sigmoid depends on the degree of its distention. When empty, and there is no unnatural growth in the pelvis to crowd it out, it will be found in the pelvis in most instances; on the contrary it may by complete distension rise to the diaphragm and occupy a position on either side of the abdomen near the ascending and descending portions of the colon.

DR. LOUIS FRANK, Louisville.—I would like to ask Dr. Cole a question which was brought to my attention by Dr. Hanes and by Dr. Reed. Will Dr. Cole explain the position the patients were in when these pictures were taken, and if the pictures were taken with the patients in various postures. This is important in connection with the work Dr. Reed has been doing from a diagnostic standpoint. My observation in the operating-room has been in accord with the points brought out by Dr. Hanes, that the transverse colon has been found exceedingly low, much lower than we had ordinarily supposed it was, and that has been practically true in all these cases. I have noted a number of times in operations upon the stomach, that we should have to search and lift the colon up out of the abdomen in reaching the duodenum in order to make an anastomosis, and I have been impressed in these cases with the length of the mesocolon in its attachment to the transverse colon. I have also observed since this the enormous size and location in many instances of the sigmoid, and have frequently found it in abdominal operations lying over upon the right side, occupying a large portion of the iliac fossa.

I would like to ask Dr. Cole to speak upon the posture, and what effect, if any, it has upon the interpretation of these pictures from a diagnostic standpoint.

DR. COLE (closing the discussion on his part).—In reference to the remarks of Dr. Morris, what he said is true of a certain group of cases. Part of these cases were included in the first article on this subject which I referred to early in the paper; others will be dealt with in one of the later papers. It is very probable that a neurotic element is accountable for the absence of peristalsis or for the extremes in the number of cycles shown in the stomach; *i.e.*, one or more than five cycles, but I cannot conceive of a neurotic condition which would cause a wave, after it has once started, to stop in the middle of the stomach. I was rather surprised to hear Dr. Morris group so many of these cases under neurasthenia. I thought we were getting away from this condition just as far and as fast as science would take us.

Where and what is this degeneration?

I do not agree with Dr. Morris that it is necessary to go back and treat our grandfathers and great grandfathers in order to get results in these cases, and the different branches of science at the present time are finding causes for this so-called degeneration or neurasthenia, and in the very near future this term will be limited to fewer and fewer cases. I believe that the absorption of toxins is the cause rather than the effect of neurasthenia.

Regarding the work which Dr. Reed has brought before you, I congratulate him on this, and his work checks up very accurately with the work which is being done throughout the country by radiologists. From observing the radiographs Dr. Reed has shown, I see that he has followed the method of giving the bismuth by mouth. In this way one can determine the progression of food through the intestines, but he fails to get the true outline of the colon. Instead of this, scybalous masses, impregnated with bismuth, are observed in the colon. This procedure is of considerable value to determine the time that food requires to pass through the intestinal tract. Ordinarily bismuth that is introduced into the stomach passes through the small intestine very rapidly. It lodges in the ascending colon and remains in this portion of the gut for a considerable length of time. Just what the normal length of time for it to remain in this portion is I believe still to be determined. Dr. Goldthwaite considers it should not remain over six hours in the ascending colon. Personally, I think that the time that it remains in the ascending colon depends upon the absorption of the food. It goes into this part of the colon in a fluid condition and it would be exceedingly inconvenient for it to pass through as rapidly as it comes in. I would, therefore, consider that the ascending and transverse colon is an organ of absorption and that the sigmoid and rectum is the reservoir. The method which I have used for the past five or six years is to give the bismuth by rectum rather than by mouth. In this manner the outline of the entire colon may be definitely determined, and I believe that this is the method now adopted by Dr. Lange whom Dr. Reed speaks of in the early part of his paper. Dr. Hanes stated that he could not see what we saw in these plates and that, in a measure, we imagined many things. Such a statement is so broad and indefinite that it is exceedingly difficult to answer in a public discussion. Dr. Hanes' observation regarding the passage of a rectal tube is absolutely correct, but his deductions that fluids will not pass readily through the colon to the cecum is absolutely wrong. I maintain, and have stated on various occasions, that if the colon is properly evacuated by the administration of cathartics for two nights and a saline cathartic the morning of the examination, that bismuth solution passed into the rectum will ascend to the cecum within eight or ten minutes, giving an outline of the entire colon, the segmental rings, the longitudinal line, and the caput coli. If the bismuth does not ascend to the cecum it is evidence of some obstruction.

This obstruction may be simply fecal accumulations which have not been completely evacuated by previous cathartics. When these cases occur a subsequent run of cathartics is given and the procedure repeated. And if on the second examination the solution does not pass all the way to the cecum within eight or ten minutes after it has been given by rectum, you can depend upon it that there is some obstruction in the gut, of the gut, or pressing on the gut.

Frequently the solution finds its way into the appendix and gives us an outline of the entire appendix. At the present time I am not prepared to state that the appendix can be injected in this manner in all normal cases, but this is a line of research work which I am carrying on at the present time.

In reference to Dr. Hanes' suggestion of injecting the bismuth solution through an appendiceal fistula, I maintain that we can get just as good distention of the gut by giving the bismuth by rectum as by injecting it through an appendiceal fistula, and that the majority of patients are not provided with this convenient opening for injecting this portion of the gut.

In response to Dr. Hanes' question of the position of the patient at the administration of the enema, I would state that ordinarily with the patient in the prone posture, the distribution of the bismuth through the colon occurs in five minutes. In cases where it does not, the enema is given with the patient on the left side; the patient then assumes the knee-chest position for about thirty seconds and lies on the right side for about a minute; then is radiographed in the prone position with the abdomen flat on the plate.

If one wants to determine the contour of the gut regardless of its position, the prone posture is the one which gives the greatest amount of detail, but if one wants to determine the amount of prolapse, radiographs are made in both the prone and erect postures. And if one wants to determine whether there are adhesions binding the colon to some adjacent viscera, radiographs are made with the patient in the reverse posture, practically standing on the head.

The stomach also varies somewhat with the posture of the patient. In the four types of stomach which I have mentioned, the plates were taken with the patient in the prone posture. A stomach which is of the text-book type in the prone posture would assume more or less of a fish-hook type in the erect posture.

In reference to the question asked by Dr. Walker, I would state that in the first three cases of carcinoma of the stomach, which I passed over rapidly because they were so extensive as to be of little value in the diagnosis, there was no evidence of retention of the food or strangulation.

DR. REED (closing the discussion).—I take great pleasure in answering some of the points and observations made by Dr. Morris. The hypothesis he has formulated in this instance is in

contravention to the biologic law that the acquired characteristics of one generation become the inborn characteristics of the succeeding generation. I do not think that our great grandfathers and our great grandmothers have anything to do with gastrop-tosis or of enteroptosis that we encounter to-day. Dr. Morris has proceeded upon the hypothesis that general peritoneal relaxation is an initial factor in these cases. There is not a particle of evidence, either indirect or direct, that this exists as an idiopathic condition. There is no evidence but what it is just as much a secondary condition as it is a primary one. There is very much evidence on the other hand that it is secondary. The condition which has been described by Dr. Cole and myself is much more logically the initial condition in the chain of pathologic events which occurs in these cases than the contrary, and proceeding upon that hypothesis we get our patients well. To say that these patients get well if we do any other kind of operation, or if we do no operation, but rely on suggestion, is to concede rather too much to psychotherapy under whatever guise it may be practised. As a matter of fact, these patients come to us after having been operated by others and are not well and have not been well. On the other hand, many of them have been made worse, and finding out that these conditions of the stomach and colon exist, we correct them, the patients get well, and stay well. What is the lesson to be taught from that? All this talk is very philosophic, and it comes with a great deal of force from Dr. Morris, because we have a profound respect for what he says, but it reminds me of an incident that occurred in a local medical society in England many years ago, when Lawson Tait was striving for recognition of his early work. Sir Spencer Wells who had, up to that time, done nothing in the way of abdominal surgery, except to remove large ovarian tumors, with a frightful mortality, arose with great profundity and said, "Mr. President, I think, sir, it is my duty to lay the hand of caution on the shoulders of undue zeal." But the man with undue zeal went on and every principle for which he contended has been accepted and has been embodied in the daily practice of the profession. I am not a prophet in my own country; but I venture to say that an acceptance of the principles for which Dr. Cole and I have contended will place both of us in that category. (Applause.)

AN OBSTETRIC ACCIDENT.¹

BY

H. S. LOTT, M. D.,

Winston, N. C.

The response was to a hurried call from a physician 12 miles distant, saying, "Come at once," that he had "used forceps and it seemed as if something had given way."

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

Reaching the home within an hour, upon examination of a multipara I found a tongue-shaped protrusion from the vagina. This was the posterior vaginal wall and from well up into the posterior vault. Introducing the hand, I found the vagina filled with intestines and found that the hand could be passed up through Douglas' pouch and into the pelvic cavity, thus holding the fundus of the uterus in its grasp. By gentle manipulation the intestines were restored and the tongue turned back into the vagina, which was then filled with a generous cotton pack, and the patient wrapped in a quilt, taken across the laps of my assistant and myself, in the rear seat of a car, and quickly driven to the hospital.

After preparation, ether anesthesia, and the removal of my pack, I found it very difficult to again restore the intestines and keep them above the fundus, but finally succeeded, and then held them there with a soft gauze wick: this brought down through the center of the rent to be subsequently used for drainage as well. Then beginning on each side at the outer vaginal wall, with No. 2 catgut, a running suture was made just to this wick on either side, thus holding in place the tongue of posterior wall which had been protruding. The wick was reinforced by an ample one, filling the vagina, and the patient put to bed, the foot of which was elevated.

For two days the wicks were not disturbed, and then by gentle traction the vaginal one was loosened and partly removed, and then each day a portion was withdrawn and cut off until the entire packing was out. Just a small one was then introduced into the cleft, which was soon shut down entirely from above, and then a hot douche of normal saline solution was given daily.

The convalescence was really uneventful; the pulse and temperature being about normal throughout the time, and the lochia was a perfectly normal one, accompanied by fairly good involution of the uterus. The patient was in the hospital for three weeks, and just before her leaving, an examination revealed a closed vaginal vault, with a running seam distinctly to be felt just behind the cervix; and the parts in about a normal condition.

In after thoughts of the case, the fact impressing me most strongly is that so very little was done with such gratifying results.

308 MASONIC TEMPLE.

IN MEMORIAM.

WILLIAM WARREN POTTER.

BY

LEWIS S. McMURTRY, M. D.,

Louisville, Ky.

THE occasion which calls us together marks the twenty-fourth anniversary of the foundation of this association. Almost a quarter of a century; a period of marvelous achievement in medicine, distinguished by great discoveries and immortal men! So many great finds have been made in medicine and surgery in this comparatively short time that we have become almost blasé in accepting and applying new knowledge. Any one of numerous discoveries would have been epoch-making, and perhaps the glory of accomplishment would be more appreciated if these great achievements had been scattered along the centuries.

It has been the great privilege of men now of middle age to have witnessed and participated in a veritable revolution in the science and practice of medicine and surgery. The fellows of this society can never forget the violent and persistent opposition encountered in securing the acceptance of new principles and the adoption of new methods. To have lived to see the adoption and fulfillment of the principles they advocated and successfully applied is surely a great reward.

When this association was founded gynecology was limited almost wholly to the plastic surgery of the female genitalia as devised by Marion Sims. The work inaugurated by McDowell was in abeyance on account of the fearful mortality from sepsis, except perhaps in the hands of a few surgeons. Abdominal surgery was but little more than a suggestion, the now established methods of intraperitoneal surgery being then undetermined. In no other record can one find a more complete and accurate record of the evolution of modern gynecology and abdominal surgery than in the twenty-three volumes of Transactions of this association.

When text-books and monographs became obsolete in a few years on account of the rapid growth of technical knowledge, the special societies became the greatest sources of advanced education. By grouping a number of men working daily upon

advanced lines, and searching for truth by discussion and comparison of results, knowledge is advanced and error corrected. But the search for truth and the acquisition of knowledge are not the only beneficent purposes of such an organization as this association. Meeting annually in various sections of the Union, and always cordially inviting the profession to attend, it is a great medium for the diffusion of knowledge in this direct manner, as well as through its published proceedings. An additional important function is that the door of fellowship has always been open to the worthy aspirant for advanced work, and many have utilized this opportunity to develop and improve their knowledge in this special field of surgery. I do not believe the most exacting critic would gainsay the statement that in all these offices, extending over the most eventful period in the entire history of medicine, any special society has labored more faithfully and with prouder achievement than the organization here assembled. Its twenty-three volumes of Transactions bear testimony that is incontrovertible.

It is well known that the success of any cooperative organization is for the most part determined by its chief executive officer. The executive officer and editor of the Transactions in this association is the secretary. Under the peculiar conditions existing at the time this association was founded, it could not have survived two annual meetings without the able, devoted and tactful labors of its first secretary, who for years has been conceded *facile princeps* among such officials. This association has had but one secretary—William Warren Potter. No purely personal interest could have elicited from him more devotion, more vigilant care, or more assiduous labor than he gave to the affairs of this association. His methodical habits, his capacity for details, and his military training in early life combined to fit him especially for this work. His genial nature and unvarying courtesy made his presence welcome on every occasion. His loyalty to the association extended to its individual fellows, and his death has brought to all a keen sense of personal loss. The sorrow of parting is tempered at this time by the repeated marks of appreciation and personal esteem bestowed upon him while living by the fellows of this association. I doubt not that he often found pleasing satisfaction in the thought that through the fraternal sentiment pervading this society his memory would be cherished during the years allotted the present generation.

Dr. Potter rendered to medical science and the medical pro-

fession many valuable services through numerous channels, but the most potential and far-reaching of these services in my judgment was his work as founder, permanent secretary and editor of the Transactions of this Association.

When the medical practice act of 1890 was made effective in the state of New York, Dr. Potter was nominated by the Medical Society of the State of New York for membership on the Board of Examiners, and his name was second on the list of appointees. In 1897 when the new law went into effect, his valuable services were recognized by his unanimous election to the presidency of the Board, and he was so continued from year to year until his death. In the language of his colleagues of this Board, "he was an ideal presiding officer, thoroughly schooled in parliamentary tactics, and ever watchful of the duties reposed in him."

In 1888 Dr. Potter became the editor of the *Buffalo Medical Journal*. This journal was founded in 1845 by Austin Flint, the elder, and has held high rank among the leading monthly medical magazines in America. Dr. Potter discharged the arduous duties of editor and publisher from 1888 until he was overtaken by illness and death. He made the journal an exponent of advanced medical science and the organ of the medical profession of Buffalo and the adjacent section of the great state of New York. Punctilious in language, courteous in every utterance, with comprehensive grasp of the most recent medical literature, his editorial work was of the highest order. He made the journal a medium for diffusing the best in medical literature, and in the editorial department he constantly held aloft the standard of professional honor and achievement. It is impossible to adequately estimate the value and extent of such a service so long and so faithfully discharged, with influences so far-reaching in results.

Dr. Potter made numerous and valuable contributions to medical literature. He was among the first operators in this country to successfully extirpate a large ovarian tumor during pregnancy with recovery, and followed by delivery at full term. The report of his case, with comments, was published in the *AMERICAN JOURNAL OF OBSTETRICS*, and has been widely quoted in gynecological literature. In 1886 he presented a paper to the gynecological section of the American Medical Association at the annual meeting held in Cleveland, Ohio, in which he made a forceful protest against the routine use of the uterine sound, and pointed out how infection and traumatism commonly follow



WILLIAM WARREN POTTER.

BORN DECEMBER 31, 1838. DIED MARCH 14, 1911.



exploration with this apparently simple instrument. He described other and more satisfactory means of diagnosis, and advocated the abolition of its use. This was the first time that the dangers of this instrument were publicly and specifically pointed out. The paper was considered extremely radical at that time, but later Dr. Potter's warning was endorsed by gynecologists generally and adopted in practice by the profession. All his papers were thoroughly practical and were written in the choicest language well phrased.

Throughout his entire career Dr. Potter was a close student, and the value of his early training as a military surgeon was manifest in all his undertakings. He was familiar with every new discovery as soon as published, and was always ready to accept advanced knowledge. As a practitioner he was an accurate diagnostician, and resourceful in therapeutics. His surgical work was clean and methodical. Although successful as a practitioner, in his later years he abandoned practice and devoted himself to the academic work of his official positions and his journal.

Dr. Potter was born at Strykersville, New York, and was the son of a physician. His academic education was received at Genesee College at Lima, New York. He graduated in medicine from the University of Buffalo. Two years after graduation, at the beginning of the great Civil War, he offered his services to the government, passed the examination of the Army Board at Albany, and was commissioned assistant surgeon of the forty-ninth regiment of New York volunteers. He served in the Army of the Potomac under McClellan and Burnside, and was continuously engaged in the field during the Peninsula and Antietam campaigns. While the army was retreating in 1862 he was left in charge of wounded soldiers, was captured and confined in Libby Prison. He was soon exchanged and returned to his regiment, promoted to the rank of surgeon, and served with the fifty-seventh regiment during the Chancellorsville and Gettysburg campaigns. After the battle of Gettysburg he was assigned to the first division hospital of the second army corps, and continued in the discharge of that responsible duty until the close of the war. He was brevetted Lieutenant Colonel for faithful and meritorious service by the President of the United States, and for like reasons by the Governor of New York. Retiring to civil life he practised medicine for a time at Batavia, New York, but soon removed permanently to Buffalo. During his service in

the army of the Potomac he was associated with our distinguished fellow, Dr. Albert Vander Veer, and there was formed that friendship which continued unbroken to the end.

Dr. Potter was a member of the American Medical Association (chairman of the Section of the Diseases of Women, 1890); Medical Society State of New York (president, 1891); Medical Society County of Erie (president, 1893); Buffalo Medical and Surgical Association (president, 1886); Buffalo Obstetrical Society, 1884-1886; president Section of Gynecology and Abdominal Surgery, First Pan-American Medical Congress, 1893; president of the National Confederation of Medical Examining and Licensing Boards, 1895-1899; secretary of the American Association of Obstetricians and Gynecologists since 1888; examiner in obstetrics and gynecology, New York State Board of Medical Examiners, and president since 1897.

Dr Potter was married on March 23, 1859, to Emily A. Bostwick, of Lancaster, New York, who died in 1906. He is survived by two daughters, Mrs. B. G. Tallman and Miss Alice Blanchard Potter, of Buffalo. His only son, Dr. Frank Hamilton Potter, a young physician of superior attainments and fine character, died in 1891.

After an illness of several weeks, Dr. Potter died in Buffalo on March 14, 1911. He received the most devoted attention of his colleagues and friends throughout his illness. The funeral services were attended by official representatives of the State Education Department; the State Board of Medical Examiners; the Medical Society of the County of Erie; the Medical Society of the State of New York; the American Association of Obstetricians and Gynecologists, and the Military Order of the Loyal Legion. In accordance with his expressed wishes, his body was cremated.

Although reared in the country and inured by military service in early manhood to the hardships of field and camp, Dr. Potter was essentially a city man. He was fond of music, of architecture, of art in general, and readily adapted himself to the changing customs of modern improvement. His literary taste was refined, and he was familiar with both classic and modern literature. He possessed delightful social qualities, was a punctilious observer of correct dress and good form upon every occasion, and consequently was a welcome addition to every company he entered. While interesting in conversation, he was always a good listener.

He was loyal to his country, loyal to his state, loyal to his

profession, and loyal to his friends. He was a genial gentleman, an honorable man, who worked through the years with an ideal always for good. He served faithfully in every position he held, and did his duty as he understood it always. He was a delightful companion, always cheery, hopeful, thoughtful, generous and kind. When his arteries were seventy, his heart was thirty. He was a brave man, and during his long and protracted illness bore himself with courage and self-control.

The writer of these lines speaks from his heart in memory of his dear friend, whose fellowship it was his privilege to enjoy through years. Of this true knight among God's noblemen we say *requiescat in pace*.

WILLIAM WARREN POTTER.

AN APPRECIATION.

BY

CHARLES A. L. REED.

FEW tasks are more difficult than satisfactorily to express an adequate and just appreciation of one the memory of whose life must always remain a cherished part of our own. Personal intimacy and personal affection necessarily imply a nearness of view that interferes with perspective, and renders difficult a just appreciation of proportions.

William Warren Potter, whose courtly manner, genial smile and warm companionship has been the chief personal feature of these gatherings for nearly a quarter of a century, is to-day the subject of your grateful memory, as he must be the theme of my brief and inadequate discourse. His life, which has meant so much to all of us during the long period of his official connection and personal identification with this organization, came to a close March 14, 1911, in the city of Buffalo, New York, after an active and useful career embracing the long span of seventy-two years.

Dr. Potter was a native of western New York, where at Strykersville, December 31, 1838, he was born, the son of Dr. Lindorf Potter and his wife, Mary Green (Blanchard) Potter. It was at a time when that part of the great Empire State had but recently been opened to the marts of the world by the completion of the Erie Canal, then as now one of the great achievements in water ways transportation of the world. There was not then, nor for several years thereafter, a railroad that, with its power

and hurry, carried the traffic of our interior country to the great seaboard. But few of the country roads were macadamized at that time, and his environment at the time of his birth and during the days of his childhood was essentially that of the American frontier, that has since pushed westward until it has vanished in the tide of the Pacific.

But western New York, then relatively primitive, offered many compensations for the lack of development that it then offered. It was young, and youth, whether of man or country, is but an aggregation of compensations for anything or everything that may be desired. It is sentient and palpitant with new life and imparts to those who come within its influence viewpoints, ideals and impulses that carry high and far on the highway of career. So it was with New York, and so it was with William Warren Potter. He went to the best schools within reach of his home and family, as good schools as there were in those days—schools with elective curricula and with characterful men at the head, organized to lay the foundations of character and give wise direction to the life that stamps with impatience to enter the race.

The hereditary bent, the parental influence, the professional environment and the temperament of one born to the manor, were doubtless jointly responsible for young Potter's selection of a career. The doctor, the country doctor in those days more possibly than now, was the hero of them to and among whom he ministered. He came, regardless of the elements, by day and by night, to ward off danger and to rescue the besieged. He, as Balzac and Watson have delineated, was the mentor of those round about him—the advisor in many things other than ills and injuries. It was this fact, I have often thought, that made the strong appeal and won to the ranks of our profession, great men, great personages of the type of Flint, and Gross, and Drake, and the hundreds of others equally entitled to a place in our enduring Hall of Fame. And it was Austin Flint, the elder, and Charles Alfred Lee, and Frank Hastings Hamilton that proved the great magnet to the young man who looked upon the world from the Arcade Seminary, and from Genesee College, and from the windows of his father's busy office in Strykersville. They were then teachers in the newly formed medical school—now, if not then, the medical department of the University of Buffalo. There was inspiration in the contact with these men, who taught the science and the art of our profession full abreast of what was then its highest development. But it was not then, nor is it now, so

much the value of the concrete information as the impartation of the love of truth, the self-abnegation by which the personal is subordinated to the abstract element, the true scientific spirit by which a mistaken preconception can be cheerily surrendered in face of the evidence, even when to do so means the scorn of the multitude. These men wrought mightily in their day, and they worked upon pinnacles whence they could see and be seen by all the world. But while thus living in the very blaze of conspicuity, they taught the irrefutable lesson that the value of labor was in its essence and not in its circumstance, and that they who wrought worthily, in modest humility, were equal in right of reward to them that labored under the fierce light. These lessons seem to have sunk deeply into young Potter's character, for we find him ever after exemplifying them in all that he did.

Throughout his entire career, he showed the quiet courage that he had seen his father display by daytime and by night in his earnest comings and goings at Strykersville; that he had seen displayed by the man who became his *beau ideal*, the man after whom he named his only and beloved son, Frank Hamilton, the Chevalier Bayard of American surgery; he had seen it shown by Flint who was blazing new roads and establishing new truths by bringing order out of the more or less chaotic therapy of that epoch; he had seen it exhibited by Charles Alfred Lee whose literary labors and whose high ethical teachings had made him a target for the small and the envious, and a model for the large and the worthy. It was not surprising, therefore, that in the midst of the fierce political controversies of the early sixties, the young surgeon, but two years away from the halls in which he had been fashioned, should stand with vigor against all doctrines, the logical outcome of which was the dissolution of the Republic as a sacrifice on the altar consecrated to man's inhumanity to man. This meant that, after the fierce rumblings of controversy, after the portentous silence of hurried preparation, when the startling crash came from the serried walls of Sumpter, there was no hesitation on the part of William Warren Potter. Among the first troops that marched to the front with set features and firm tread was he whom we honor here to-day—Assistant surgeon Potter of the forty-ninth New York volunteers. He went then, as he went ever after, to the call of duty, and right worthily did he stand to his post. We can see him now at the awful carnage of Bull's Run; we see him at his post whence the army had fled, leaving him unprotected to bind up the wounds of the fallen; we

see him thus fall a captive into the pursuer's hand; we behold him in the prisoner's gang on the long road to incarceration, but fancy fails us when we try to picture him among the inmates, and a participant of all the horrors of Libby Prison. We cannot here trace that brave and chivalrous career, his exchange, his return to ranks and labor, his long campaigns, the fierce carnage of Chancellorsville and Gettysburg, up to Richmond, when after the great surrender, the last bugle call dissolved the armies engaged in that Titanic conflict. But I always like to think of him clad in tattered uniform, turning his face triumphantly homeward, conscious of having done his full duty, going back to home and wife, to her who had been bravely with him on more than one battlefield—back, like every good American citizen, to the duties of every-day life, carrying with him thanks and honors alike from the people, from the governor of his state, and from the president of the nation that he had helped to save. And I like to think of him, too, as I had the pleasure of once seeing him only a few years ago, around the campfire of the Loyal Legion—a campfire whose embers reflected then as, thank God, it still reflects the patriot glow on the faces of assembled heroes.

When the soldier-surgeon returned to civil life, he found his first activities in the rural communities of Mount Morris, and later at Batavia in his native state. Here he labored in the same methodical way, and with the same fidelity to duty that always characterized his career. It was not long, however, until he discovered his special aptitude, and saw that his usefulness lay in the direction of gynecologic practice. This department, under the impetus of Marion Sims, Emmet and Thomas in this country, and Spencer Wells, George Granville Bantock and Lawson Tait in England, was just coming into specific recognition. It at once commanded the zealous attachment of Dr. Potter, who, that he might follow this branch of work more exclusively, went to Buffalo to practice. Here, however, was soon displayed the fact that, while man may have an intellectual appreciation of, and aptitude for, a particular calling, any temperamental tendencies of a conflicting character, being deeper and more determinative, frequently change the best conceived plans. Dr. Potter was intellectually and by training a gynecologist, but under it all was the executive, the editor and the literateur. These tendencies soon so far asserted themselves that he was induced to take over the congenial labors of the editor, and became the proprietor of the *Buffalo Medical Journal*, that many years before

had begun an honorable and useful career under the elder Flint. This labor, more to his liking, pushed aside his practical work, and left him a line of activities that inured largely to the benefit of his profession. True to his early ideals, he sought to make his periodical, and did make it, one of the cleanest examples of English, one of the highest advocates of broad, progressive and sound ethics, one of the most reputable media for scientific publication among the medical periodicals of America. It furnished him, furthermore, a vantage ground of observation, from which he viewed with keen vision the activities of his profession as a whole, not only in the nation, but particularly in his native state. His studentship of the great problems that must be solved by that profession, as a profession, enabled him to see and know that its national organization at St. Paul in 1881, perpetrated a wrong that it corrected at St. Paul in 1901—I am proud to say, under the presidency of him who addresses you now. In the interval, however, Dr. Potter, like his colleagues in the state of New York, was subjected to an unrighteous ostracism, to which he submitted with a patient forbearance always displayed by a well-balanced man who knows that he is being persecuted for righteousness sake, and who rests in tranquility upon the abiding faith that the fullness of time will bring justice in rounded measure. Dr. Potter saw this cycle nearly, but not quite, completed in the long and unhappy incident to which I have alluded. He died a few months before the event that forever wiped out the sting, if not the memory, of that great mistake. The man who was president of the Medical Society of the State of New York at the time of its expulsion from the American Medical Association in 1881, the honored Abraham Jacobi, was elected president of the American Medical Association in 1911. Thus, after three long decades, do we see the vindication of the principles for which Dr. Potter contended during all of that period.

It was this same devotion to high ideals that prompted Dr. Potter to identify himself with the long agitation for the establishment of medical examination and registration in New York, and that prompted him to accept from the Regents of the University of the state of New York a commission on that executive board, that has done more than any other one thing to bring the medical profession of that state to its present high standard. I may go further and state that, by the conspicuous success with which the medical law of New York has been administered, and by the high standards it has established and enforced, it has had a salutary

and determining influence upon medical legislation in practically every other state in the Union.

Merit of the high character displayed by Dr. Potter in all of his relations sooner or later commands recognition from those who are its appreciative observers. His labors at Albany, his constant devotion to better things, his recognized ability as an executive naturally led, in due season, to his choice as the president of the Medical Society of the State of New York—a position which he filled with conspicuous ability. He once occupied the position of chairman of the Section of Obstetrics and Gynecology of the American Medical Association. But of all his society work, of all his labor to organize and make better the profession for which he always labored, his devotion was greatest to the American Association of Obstetricians and Gynecologists.

I was not present at the meeting for organization at New York, although I was in sympathy with the movement, and, by correspondence, gained the honored distinction of being one of its founders. I know, however, that he was one of its instigators, if not the first to conceive its organization. He was elected its first secretary. Twenty-four years have elapsed, and until death removed him, the place was never occupied by any but him. Every volume of literature that has emanated from its meetings bears the stamp of his revisionary acumen, a fact which doubtless has had much to do with the appreciative cordiality with which it has been received by the profession, and, also, that it is probably the most widely quoted literature in latter day gynecology and abnominal surgery.

The limits of the time assigned to me make it impossible that I should go into each incident of his life and draw therefrom, as could easily be done, a useful and inspiring lesson for his profession, for the kindred who survive him, and especially for his two grandsons, upon whom alone devolves the privilege of transmitting his honored name to succeeding generations.

He lived and labored faithfully, day by day; he sought no other reward than the appreciation of them whom he served, and the affection of them to whom the soul naturally turns for responsive throbs. He exemplified high qualities in unostentatious ways. He was an honorable man, he was our faithful friend, and we miss him.

REMARKS ON THE LIFE AND WORK OF
DR. POTTER.

BY

DR. ALBERT VANDER VEER.

DR. VANDER VEER said: Mr. President and Fellows of the Association: I did not expect to be called upon at this particular time to refer to Dr. Potter's work, but I feel that fullness of affection for him, that it seems as if I ought to take a few minutes of your time and relate something about the duties that devolved upon him in connection with the profession of the State of New York. I became acquainted with Dr. Potter in 1863. After the Battle of Gettysburg we went back into our temporary quarters for a time and organized a division medical society. Coming from the same state and working in the same division, we soon realized we were acquainted with the men of our State, and in that society, which originated and continued through the remainder of the Civil War, our fellowship became very intimate. I did not meet Dr. Potter again until later, when as members of the State Medical Society we came in contact with each other in connection with the presentation and discussion of papers, as well as in doing the official work which came to us from time to time.

I cannot add anything to what has been said by Dr. McMurtry and Dr. Reed in regard to his life in general; but I am perhaps a little more intimately acquainted with his work in regard to the development of medical education in the State of New York. I served with him on the committee from our State society in the Legislature, and am consequently very familiar with the efforts that were made and which had to be continued for a number of years in order to establish a state board of medical examiners, and in that time I found him a personal friend. I found him persuasive in his arguments with the members of the State Legislature. I found him always loyal in his friendship, and in other ways our friendship ripened in various directions. At last, we secured a law that permitted simply the registration of physicians in our State, but Dr. Potter was one of a number of us who said this is not at all what we are after and we must work with greater energy. Through the efforts of the State Medical Society the Legislature finally established three state boards of examiners. Dr. Potter, as has been stated, was made the president of the first board. You will all remember that the agitation continued in our State in regard to these three boards. We were very much disturbed when the osteopaths showed the amount of strength they did and the possibility of their securing an additional state board of medical examiners, and along with that we had two very impressive campaigns in which the Christian scientists presented a petition for the privilege of being recog-

nized for the treatment of diseases, and we also had developing another sect called the neuropaths.

Dr. Potter was a member of the Committee on State Education from the three boards and together with the committee from our State Board of Regents we evolved the principle that we believe if we had one state board of medical examiners it would be the best thing, and that if the osteopaths were to be recognized by the Legislature, we believed that therapeutics should be excluded from the state examination. If the candidates of any of the other schools, except the regular, wished to take an examination in materia medica and therapeutics, they could do so, but could not prescribe unless they passed the regular examination. This met with the approval of our best senators, men of intelligent thought, and it met with the approval of the governor at the time, and this law passed. From that time on we have had one Board of State Medical Examiners. I happened to know how the last board was made up. A very careful canvas was made as to the men to be retained from the three boards, but at no time was any doubt shown in regard to Dr. Potter. He was appointed at once. He was made President of the new board of examiners, and he did his work with that same faithfulness and with that same degree of intelligence that has always characterized his work.

With Dr. Potter on the State Medical Examining Board, the Board of Regents felt safe. They felt they had a man who would protect the interest of the State. Dr. Potter was in sympathy with the changes made at that time in regard to the methods of examining students. He protected the commonwealth. He did justice to the students, and this was fully understood and gave him the confidence that was needed.

The beautiful language used in these two able addresses is nothing more than Dr. Potter deserves. His uniform courtesy, his loyalty to duty, and his great executive ability were such that fifteen gentlemen, representing as many States, when this association was organized, thought it wise to elect him secretary. It was a most remarkable coincident, that of the number present representing these states, when the question was asked, "Who shall we elect as secretary?" two-thirds of them replied at once, that if Dr. Potter would take the position, he would make a most excellent executive officer. He was elected secretary, and all of you know of his valuable work. The last conversation I had with him was just after an executive committee meeting of the state board in Albany. He told me of his condition, but his thought was directed toward this association. He spoke of it in a very feeling manner. We are here to-day to pay him his just tribute, and let us make no mistake in following out his line of work.

IN MEMORIAM.

JOSEPH PRICE.

BY

W. KENNEDY, M. D.

JOSEPH PRICE was born in Rockingham County, Virginia, January 1, 1853. Received his early schooling at Fort Edward, N. Y; later attended Union College. Obtained his medical degree from the University of Pennsylvania in 1877. Married Miss Louise Troth, of Philadelphia, by whom he had seven children.

Dr. Price began his work in the Philadelphia Dispensary in 1877 and early became in charge of the Obstetrical Department and organized the Gynecological Department of this institution. It was his early work in the Philadelphia Dispensary that laid the first stepping-stone toward his magnificent career as a man and surgeon.

His fertile brain and tireless energy were early conspicuous by his ability as teacher and leader. The gynecological and obstetrical departments of the Philadelphia Dispensary, under his leadership, became one of the most conspicuous and largest clinics in the country.

It was during his early association with this institution, that he began his abdominal surgery, most of his work being done in the slums of Philadelphia, in the midst of filth and squalor.

He attained, in this work, at the dawn of aseptic abdominal surgery, an unequaled record of one hundred sections for pelvic suppuration, with one death. Thinking operators cannot dismiss this record. A great master of a simple technic had completely dominated his unsurgical surroundings by the most brilliant results of any age.

Dr. Lewis S. McMurtry, his life long friend and intimate associate, says: "To justly estimate the life-work of Joseph Price and measure his influence upon the development of modern pelvic and abdominal surgery, it is necessary to consider the conditions existing back in the early eighties when he entered the surgical arena.

"At that time the principles of Lister, as evolved from the researches of Pasteur, were accepted unreservedly by only a few, while in a half-hearted way others pretended to apply those principles in practice. The epoch-making work of Lawson Tait, while laying the foundation of modern pelvic and abdominal

surgery, and replacing antiseptis with aseptis, made indescribable confusion in the surgical mind by an apparent rejection of the essential principles of Lister.

"Progress at that time was materially obstructed by an unnecessary conflict between antiseptis and aseptis, when in fact the principles enunciated by Lister as to the relation of micro-organisms to infection were the basis of every successful method of wound treatment.

"During these years the older surgeons, who occupied positions of authority, as teachers and hospital surgeons, either rejected *in toto* the new surgery, or accepted it as an experiment only. The great body of the profession, always disposed to follow established authority, was ready to discredit the claim of the innovation, and for the most part refused to accept the results of the new surgery. Not only was opposition directed against the new methods of operating, but the new pathology, especially as to infections of the Fallopian tubes, ovaries, and peritoneum, ectopic gestation, appendicitis, etc., was denied acceptance and reported cases were discredited. In a word, those established in authority resisted change, and the body of the profession was disposed to adhere to conservative methods in preference to what seemed most radical. A revolution was in progress, and, as in all periods of medical history, it was opposed by the powers in control, while those advocating the new order were maligned and abused. It was so in the days of Harvey and Jenner. When as late as in 1870 Pasteur made a visit to Von Liebig in Vienna, with the hope of demonstrating to him the marvelous results of his labors, Von Liebig, while receiving him courteously, emphatically refused to even discuss the subject with him. So it has always been, and so doubtless it will always be.

"Such were the conditions in the surgical world when Joseph Price entered upon his career. He gave his whole soul to the work. His enthusiasm was beyond control, and he became a militant advocate of the new surgery. With the courage of a Spartan, with matchless skill and judgment as an operator, he forged to the front and made an aggressive figure on every available field to establish the new surgery. It required courage; it made many enemies; but with him it was a fight for science and humanity. During the years from 1885 to 1900 he was an imposing figure in the medical profession of America. He impressed the profession more by the spoken than the written word, and was a constant attendant upon the medical societies.



JOSEPH PRICE, M. D.

BORN JANUARY 1, 1853. DIED JUNE 6, 1911.

He addressed county, state, and national societies; and in almost every state of the Union and also in Canada he discussed the surgical problems of the day. But his teaching was most inspiring and forceful at the operating-table. His clinic was thronged for years with young, ambitious, and progressive surgeons from every part of the United States.

"He stripped from surgery all complicated paraphernalia, and made its technic simple and thorough. Every prominent surgeon in this country to-day demonstrates in his methods the impress of this master-surgeon."

From 1887 to 1894 he had charge of the Preston Retreat, during which time there was not a death from sepsis. If his career had ceased here, he already had established an enviable record by his enthusiastic efforts to place obstetrics on an aseptic basis. His magnificent work in the Preston Retreat should not be blotted out by his exceptionally brilliant career as an abdominal surgeon. It is impossible to estimate the great service he did our profession by his early obstetrical teaching. He was founder of the Philadelphia Gyneccean Hospital, where his teachings and object lessons are reflected through some of our most conspicuous operators.

In 1891 he opened his private hospital, 241 North Eighteenth Street, Philadelphia, it being the largest private institution in our country for abdominal surgery. His simple technic and masterful work in this institution is world-wide in reputation.

Could any one have had more of the necessary qualities of a surgeon than he—courage of a lion, most dexterous in his manipulations, quiet, cool, and as patient as a child when patience was a necessary virtue. He was a most esthetic and painstaking operator. He had no patience with the man who operated by the clock. He taught constantly by and through his operations, and, although never making any attempt at speed, his manipulations were without a useless move, which gave him the greatest dispatch in his work. He was so definite in his touch that many of his operations were done with the skill of a juggler, and on account of this dexterity, he was often spoken of as "The American Tait." His capacity for work was unlimited, and it is doubtful if any operator has done as much difficult abdominal surgery; he never picked his cases and never refused to give any patient the last chance on account of his own mortality. He was a pioneer in pelvic surgery and probably did more to establish the pathology in the surgical treatment of pelvic suppurations than

any man in America. His finished enucleation of tubal ovarian abscesses was classical and he was the acknowledged master of this work.

His great vigor of constitution permitted him to travel over the entire country, giving object lessons to an eager profession. He was the greatest exponent of the local hospital and no one dedicated more of these institutions throughout the land. It is impossible to estimate the great good he did the profession and laity by his constant labor to establish this local institution and place within its walls competent operators.

In plastic surgery he was an artist and beautiful demonstrator. He was one of Dr. Emmet's most ardent followers. It can be truthfully said of him, he had the combined qualities of an Emmet and a Tait.

To the hour of his death he remained the greatest advocate the country had of the so-called pathological era in abdominal surgery. His earnest pleas for early work, followed by radical toilets and ever removal of the distal infecting source, will stamp his work immortal.

He was always the refined physician and had the greatest distaste for the commercialism which threatens our ranks. The vulgar system of graft, which in recent months is worm-eating the heart out of the American profession, he viewed with great apprehension and profound regret. His ever desire to help the young physician or member in distress, was so typical of the man. His professional charity had no equal. It can be truly said that no public institution in America was more accessible to the poor, irrespective of race, than his private hospital.

Like all forceful men, he had his enemies. How unprovidential that even they should separate themselves from his benefaction.

He was President of the American Association of Obstetricians and Gynecologists in 1895.

A month prior to his death Dr. Price was given the degree LL. D. by Union College.

He died on the sixth of June, from a retroperitoneal infection, which had existed as a metastatic condition from a prior septicemia.

Exalt his skill as you justly may, but it was Price the sterling man which made him most my beloved master.

IN MEMORIAM.

CARLTON C. FREDERICK.

BY

HERMAN E. HAYD, M. D.,

Buffalo, N. Y.

DR. CARLTON C. FREDERICK was born in Hamburg, Erie County, New York, on May 1, 1855, and died on April 30, 1911. He came to Buffalo with his parents when fourteen years of age, and attended the public schools and the Central High School and then went to the University of Michigan, Ann Arbor, where he graduated with the Bachelor of Science degree in 1877. He then taught school for two years with Prof. Horace Briggs. In 1878 he entered the Medical Department of the University of Buffalo, and graduated in 1881. He served as interne in the Buffalo General Hospital, and while in that capacity assisted Dr. Matthew D. Mann, gynecologist and obstetrician to the hospital.

When the Niagara University started its Medical Department he joined forces with Dr. Thomas Lothrop—a deceased member and one of the founders of our association—and became associated with him in the Woman's Hospital of Buffalo, and later acquired a half interest in that institution. He was obstetrician to the St. Mary Asylum in 1885. In 1891 he went to Europe and spent some months in study in Berlin, Leipsic, Dresden and other large medical centers. He did his first abdominal operation on Novemebr 19, 1891—a double pyosalpynx—and was assisted by Dr. W. S. Tremaine, and on November 21 he did his second operation, assisted by Drs. Herman Mynter and Jacob Meyer, and from that time on his work grew until his fatal illness in April.

In his early years he had a large obstetrical practice, and was a very active general practitioner and obtained in this way a splendid foundation for his future special line of work. He was president of the Medical Association of Central New York in 1908, and president of the Buffalo Academy of Medicine at the time of his death. He was also a member of many local societies—the Medical Society of the State of New York, The American Medical Association, and the American Gynecological Society.

He was adjunct professor of obstetrics in the Medical Depart-

ment of the Niagara University, and when this school closed its doors in 1898 he became clinical professor of gynecology in the University of Buffalo.

About thirty years ago when I came to Buffalo, I first met Dr. Frederick, and early in my career I was on terms of intimate friendship with him, and, during all these years of close contact and professional association, my affection and interest grew deeper, so that I was always able to number him among my warmest and closest friends. Living as we did in the same city, and having ambitions along the same lines of practice and stimulated into competitive fields of labor by the same hopes and possible rewards, I was given the very best opportunities to know Dr. Frederick's true value as friend, rival, and ever-willing counselor, and especially so because our interests often clashed—"he got my cases and I got his." My first hospital appointment as gynecologist I held with him in the Erie County, and my private work for many years was done at the Woman's Hospital—his institution—where he always stood ready with cheerful heart and hand to help and make easy my first operative undertakings.

After a few years of general practice, our interest developed along the same lines of work, and both of us became members of this Association, he being my senior by four years. In 1891 he became an active member, and from his initiation he took a great interest in the work of the society and presented a paper—often annually—upon different practical questions which were engaging the attention of the active surgeons, and, at the same time, he took part in various discussions. His first paper was "A Plea for Consecutive Operations upon the Appendages," and in that paper he vigorously protested against the removal of the ovaries for purely functional troubles—so-called reflex disturbances—unless gross pathology could be made out by vaginal and pelvic examination. His contributions to our Transactions are many, and his papers are usually devoted to the consideration of some live subject, as "Neurasthenia Accompanying and Simulating Pelvic Diseases"; "Which is the Preferable Operative Method for Holding the Uterus in Position?" "Some Rare and Odd Cases and Experiences in Pelvic and Abdominal Surgery, and the Lessons They Teach"; etc. Perhaps no paper gave him the national reputation and showed the wealth of material and the amount of experience at his command as did that one he wrote upon the degenerations which take place in uterine fibroids, and which he read before the American Gynecological Society, in



CARLTON CASSIUS FREDERICK, B. S., M. D.

BORN MAY 1, 1855. DIED APRIL 30, 1911.

1902. These observations attracted considerable attention, and the deductions made in this paper stimulated a greater interest in this subject, and his statistics were quoted and commented upon by many writers in this important field of work. As a member of our Association he became distinguished, and men listened to what he had to say because it represented advanced work in pelvic and abdominal surgery; and secondly, because he was a practical, thoroughly honest, conscientious man and of good judgment. His personal characteristics, sweetness of temper and suavity of manner brought to him many close relations in the Society. Men looked upon him as a fair and honorable colleague. He possessed the happy faculty of being forceful and energetic, but yet considerate of the opinions and feelings of others. He was fearless, but not tyrannical. He was kind, but not obsequious. He was self-appreciative and reliant, but not conceited and boastful, and in debate and scientific discussions he was temperate, persuasive, practical and resourceful. In his home his relations were beautiful. He was always a loving and thoughtful husband, a tender and affectionate father. He leaves a widow, and one daughter twenty-three years old, and one son seventeen years old.

As a surgeon in our community he had a very large clientèle and was loved by every one and he enjoyed the confidence of the public and his brother physicians. He was a brilliant operator—quick, cool, resourceful, practical, and bold, but yet honest and conservative. He was a painstaking teacher, and the students enjoyed his clinics and practical talks and demonstrations. Unfortunately, at the height of his usefulness, when only fifty-six years of age, when the suffering and afflicted could most have benefited from his trained mind and experienced hand and when the young surgeon could have called upon a responsive and sympathetic friend and helper in times of worry and distress, Dr. Frederick is suddenly and prematurely taken from us.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of October 26, 1911.

H. D. FURNISS, M. D., *in the Chair.*

DR. HERMANN J. BOLDT presented two cases of perplexing diagnosis.

CASE I. TUBOOVARIAN INFLAMMATION RESEMBLING ECTOPIC GESTATION.

This patient was thirty-two years of age, had been married three years, but was never pregnant. She presented herself on October 3 and gave a history of atypical bleeding which had lasted for a week, after being "overtime" about two weeks. She complained of pain in the left iliac fossa.

There was a slight increase in the size of the uterus and some softening in its consistency. To the left of the uterus, a distinct enlargement could be felt which was thought to be the distended Fallopian tube. Colostrum was present in the breasts. No attempt was made to palpate the ovary separately since there is always some risk of causing a rupture of an impregnated tube by using pressure when making a bimanual examination, and because it was believed that the subjective and objective symptoms were sufficient to point to the probable existence of a tubal gestation. One symptom to which Dr. Boldt had previously called attention at frequent intervals and which experience had taught him to consider important in the chain of symptoms was absent in this instance and that was pain caused by moving the vaginal part of the cervix forward. In cases of ectopic pregnancy this caused pain in the lower part of the rectum; many patients with tubal gestation had rectal pain described as "sticking" in character, even without moving the vaginal portion of the cervix. Upon operation it was found that this patient had a small ovarian cyst, about the size of a walnut, with catarrhal salpingitis.

CASE II. TUBAL PREGNANCY WITH ATYPICAL SYMPTOMS.

This patient, a woman twenty-six years of age, consulted Dr. Boldt because of atypical bleeding which was thought by the patient herself and by a physician whom she consulted to be due to an abortion. There were no symptoms, not even the slightest pain. Examination revealed nothing pathological in the pelvis. As the bleeding was slight the patient was advised to do nothing.

The ovary on the left side was high up near the pelvic brim; the right had previously been removed on account of tubal pregnancy according to the statement of the patient. After an intrauterine application the spotting stopped and the slight loss of blood ceased. The patient again consulted Dr. Boldt on October 13 when she complained of dull pain on the left side at the site of the ovary, which was thought to be due to a mild ovaritis since the ovary was sensitive to the touch on bimanual examination. She had suffered much pain during the night previous to consulting Dr. Boldt. Examination showed the pelvic peritoneum sensitive throughout yet no other change could be found upon palpation. The diagnosis of probable tubal gestation was made, yet on account of the absence of even a single definite objective symptom nothing was said to the patient since she was extremely nervous. She was ordered to get a nurse, go to bed, keep quiet and apply an ice-bag to the abdomen.

On the night of October 15 she had another attack of pain, not characteristic, however, of ectopic gestation. A physician who was called in made the diagnosis of ectopic pregnancy, and when seen by Dr. Boldt on the following afternoon he thought the diagnosis probably correct, though there was not the slightest corroboration for such a diagnosis according to the objective symptoms. The temperature had varied from 100° to 101° since October 13. There was no distention of the abdomen, but sensitiveness upon pressure in the left iliac fossa. There had been no attack of fainting, much less of collapse and there was no anemia.

On the morning of October 16 the patient had another attack of pain and the physician informed Dr. Boldt over the telephone that some distention was present, upon hearing which Dr. Boldt had the patient sent to the hospital. She now for the first time showed the beginning of a hematocele in the left pelvic cavity, although not distinct. The patient had pain when the vaginal part of the cervix was manipulated so as to move it forward. There was no abdominal distention. About two hours later the woman was operated upon. There was probably less than 100 c.c. of blood in the abdomen, including that which had coagulated and formed clots. There was a small rent in the tube wall near the uterine cornu. No attempt was made to remove the blood although it was recognized that a mild infection was present since there had been elevation of temperature with an acceleration of pulse rate. Experience had taught that the less manipulation that was done in the abdominal cavity, consistent with the condition found when operating, the better was the chance of the patient getting well. The peritoneum was able to take care of much pathological product, particularly if there had previously been some peritoneal irritation. On the second day the patient suffered from the effects of the blood that had been left in the abdominal cavity, but the symptoms passed away within two days. The symptoms of absorption of blood under such circumstances consisted of moderate elevation of temperature, accelera-

tion of pulse rate, thirst, sometimes nausea and vomiting, and more or less abdominal distention. Usually all these symptoms disappeared after the intestines had regained peristalsis and a bowel movement had taken place. Such was the case in this instance. Salicylate of eserine was usually effective in these cases if no peritoneal inflammation was present; it should be given in doses of not less than one-fortieth of a grain subcutaneously, repeated at intervals of four hours, until four injections had been given. The application of cold to the abdomen seemed to give no appreciable benefit but seemed to make the patient feel more comfortable and it was his custom to make the application. Cracked ice should not be given to allay thirst as it only aggravated the thirst instead of allaying it.

Dr. Boldt analyzed these cases to see if a diagnosis could have been made with certainty, in the first instance at the time of examining the patient, and in the second at an earlier period without resorting to surgical intervention.

In the first case the character of the pain was not such as was usually found in patients having ectopic pregnancy; it was a steady sharp pain, not the cramp-like variety, and, furthermore, pain was absent on manipulation of the cervix. For these reasons there was reasonable doubt as to the correctness of the diagnosis. The symptoms of pregnancy, however, were sufficiently marked to consider its existence extremely probable. Then with the tumor to the side of the uterus, small and painful to the touch, colostrum in the breasts, it seemed reasonable to suspect tubal pregnancy before rupture, particularly as the husband had had specific urethritis before marriage. With the subjective and objective symptoms narrated, an exploratory vaginal section to corroborate or disprove the diagnosis did not seem to be called for.

As to the second case, Dr. Boldt said that too frequently patients who bleed as the result of an ectopic gestation had been subjected to curettage under the impression that such patients had incomplete abortions. In some cases there were absolutely no symptoms other than the bleeding. Such diagnoses should not be criticized but there was no reason why a patient in such a condition should be curetted when there was no change from the normal in the size, position, and consistency of the uterus, and if bleeding amounted only to spotting.

The next question was, "Would the diagnosis of ectopic gestation be justifiable by anyone under such circumstances?" Decidedly, "no." It was not difficult to diagnose an ectopic pregnancy in a typical case, but when one said that he could invariably make a correct diagnosis of that condition in atypical instances, such a person was not reliable. It was very common to err in making a diagnosis between purulent salpingitis and tubal pregnancy. It was not justifiable to subject a patient to operation unless there was present more reason than mere suspicion of ectopic pregnancy. It would be quite as reasonable

to operate for carcinoma of the uterus because they had atypical bleeding; yet here it would not be reasonable to remove the uterus until they had positive evidence of malignant change in the endometrium. In that class of patients where immediate operation was imperative in ectopic pregnancy, there was the objective symptom that could not be mistaken, namely, acute anemia with almost imperceptible pulse or complete absence of the pulse. Moreover an expert could usually determine the evidence of fluid in the pelvis. In the cases narrated Dr. Boldt did not believe it was possible to make an earlier diagnosis with certainty. They occasionally read of making a diagnosis of extrauterine pregnancy before rupture of the tube. It was a fact that in the greater number of cases there was no rupture, but tubal abortion took place. Furthermore, patients are not likely to consult a physician before the beginning of a tubal abortion; it was a mere chance if they got the opportunity to examine a patient before the beginning of rupture.

In regard to the etiology of ectopic gestation, no one factor played such a great rôle as gonorrhea. Dr. Boldt said that he did not recall a single instance among the large number in which he had made particular inquiry, in which the husband had not at some time had a specific urethritis.

DISCUSSION.

DR. SAMUEL M. BRICKNER said he wished to endorse what Dr. Boldt had stated in regard to the diagnosis of an extrauterine pregnancy being so easy; he heartily endorsed this statement of his. This was a point he thought the Section on Obstetrics and Gynecology should particularly insist upon. No statement should be allowed to go from this Section that the diagnosis of an extrauterine pregnancy was an easy matter.

With regard to gonorrhea, either in the male or the female, being a constant source and etiological factor in extrauterine pregnancies, 90 per cent. of men would be found to have had this disease at some time or other.

Again there may be found some malformation of the Fallopian tube, or a polyp, especially on the same side as the extrauterine gestation, or again there may be a reversion to type of the tube, thus placing the origin upon a biological basis. There were a great many cases in which it was absolutely impossible to find an etiological factor for the extrauterine pregnancy except a preceding gonorrheal infection and we must accept that statement as a dictum.

DR. HERMANN J. BOLDT did not believe that they could state positively that gonorrhea was a factor or that gonorrhea was not a factor in the causation of extrauterine pregnancy. He stated that it is the belief that it plays an important rôle as an etiological factor. The fact that many more men have had gonorrhea, and that their wives did not conceive extrauterine, was no argument at all against his view.

ESTHIOMÈNE AND SECONDARY ELEPHANTIASIS VULVÆ (ULCUS VULVÆ INDURATIVUM EDEMATOSUM).

DR. ARTHUR STEIN and DR. W. J. HEIMANN presented this communication. The patient was thirty-three years old, married thirteen years, and gave practically a negative family history. She had never been pregnant. About three years after her marriage her husband acquired what appeared to be gonorrhea, was treated by injections and, according to his own story, completely cured. He denied any other infection. Shortly after the husband's infection, she noticed a painful discharge from the rectum; this increased in amount; there was occasional bleeding during defecation and pain. She was treated for hemorrhoids with an improvement only in her condition. About six weeks ago she noticed a painless swelling about the anus. Different physicians she consulted and she was given treatment consisting of irrigations, the use of mercurial ointment and iodides. She failed to improve and discontinued treatment; the external genitals grew larger and harder and had remained so for the past two or three years. There was never any pain on micturition. The constant secretion from the rectum continued to cause her great annoyance.

When first seen in May 1911, the lesions involved an area extending from the mons veneris over the larger labia backward to about an inch behind the anus, and laterally about 2 inches to either side of the intergluteal fold, and over the glutei. The lesions over the mons and larger labia consisted of pale yellowish to orange-colored macules, papules and cysts, varying in size from a pin head to a kidney bean; they were isolated and grouped; the cysts contained a limpid alkaline fluid. The more anterior ones were flatter and smaller than those lying over the posterior part of the labia. Those about the anus and immediate vicinity were fleshy, an inch or more in length, and so closely crowded as to mould each other by pressure. There were no cysts here. All the lesions were hard. Here and there a superficial ulceration was visible. The labia were equal in size, enlarged, and in shape resembled a cucumber. They were easily movable, painless and not tender. Illustrations were presented showing the distribution of the lesions. The swellings of both labia were so large as to cover over the introitus vaginæ. The labia minora seemed to be normal in size and consistency. The preputium clitoridis was edematous, hard, and enlarged to about the size of a pencil. The clitoris was also enlarged and hard.

At present the cystic lesions were no more. The color was of a uniform dusky red where it had previously been yellowish. The distribution of the lesions was unchanged. From the fossa navicularis downward to about an inch beyond the anus and extending about 2 inches from the median line over the buttocks there was an irregular polypoid, hard and indurated mass, the margin of which was edematous and indurated. The

ulcers were small, few in number, very superficial, and in no wise resembling those of tuberculosis or lues. The anus was completely concealed by the polypi. The whole rectum as far as the finger could reach was similarly transformed; its walls were irregular and covered by polypi and the periproctal tissue was indurated. Rectal examination caused no bleeding. The internal genitals, uterus and adnexa, and parametrium were absolutely normal. The mucosa of the rectum was seen to be highly inflamed; turning the proctoscope upon its axis showed the mucosa to be covered with papillomatous growths of various sizes resembling those about the anus.

The deductions to be drawn from this case were comparatively clean cut. There was a chronic disease characterized first by a destructive process, secondary to which developed elephantiasis, lymphatic dilatations even to the point of cyst formation, finally papillary hypertrophy or polypoid excrescences. The clinical and pathological evidence ruled out direct specific caustic agents, notably those of syphilis and tuberculosis. Likewise malignancy might be definitely excluded. Obviously then the lesions must be a manifestation of some remoter cause. This they found in the first place in the chemical irritation of the discharge from her rectum, and in the second place in the rectal stricture, both presumably being due to an earlier rectal gonorrhea. On purely mechanical grounds the lymphatic status would account for every clinical and pathological feature except the original ulcerations. Such a condition and process at once destructive and hypertrophic would correspond to what in later years had come to be understood under the term *esthiomène*. In looking over the literature they found but once case that absolutely corresponded to the one they described. It seemed clearly established that they were dealing with a condition the etiology of which was still vague. Strange to say the first case in the literature, described by Tilbury and Calcott Fox in 1879, was one in which the lesions were located upon the perineum and thighs.

DISCUSSION.

DR. WALTER JAMES HEIMANN said that he had very little to add from the gynecological point of view, but there were some considerations more or less dermatological that arose which he would like to speak briefly about. There were three or four conditions which should be considered in the examination of cases of this type, and the first was *condyloma acuminatum*, but this condition could be readily ruled out. Then there was another group of cases originally described by Tilbury and Calcott Fox in 1879 under the name of *Lymphangioma circumscriptum cutis*. When the patient was first seen at the hospital last May the first diagnosis, or rather the first impression was that they had to deal with *lymphangioma cysticum*, or a circumscribed cystic lymphangioma. Upon a more careful study of the case,

however, they were unable to find any of the pathological features of this condition and, therefore, this diagnosis was ruled out. Finally a diagnosis of esthiomène and secondary elephantiasis vulvæ was made, the excrescences appearing over the anus and gluteal regions.

In the first case of lymphangioma; that described by Tilbury Fox, the growths were found on the perineum; this was the only one in this localization to be found in the literature. It occurred to Dr. Heimann that this might be a connecting link between lymphangioma and the type of esthiomène under discussion. The typical localization of the lesions of true lymphangioma were found to be around the shoulder girdle, the face and occasionally on the tongue. The lymphangioma cysticum would be filled with a clear, limpid yellow fluid, the cysts varying in size from a pin point to a lentil. They are grouped in patches, 1 to 4 inches in diameter. The base upon which the cysts rested was noninflammatory. The case Dr. Stein presented could not possibly be diagnosed as a circumscribed cystic lymphangioma. The latter with its dilated lymphatics, blood-vessels, evidences of inflammation, etc., was only a type of lymphangiectasis. There were few clinical and no histopathological evidences characteristic of idiopathic cystic lymphangioma.

PROLAPSE OF THE UTERUS.

DR. WILLIAM H. WELLINGTON KNIPE reported this case. The patient was now fifty-four years of age, a janitress, and had always worked very hard. She had had eight children and no miscarriages. After the birth of the seventh child there had occurred a complete prolapsus uteri, which had been repaired by some vaginal operation at Bellevue Hospital. Two months after the first operation a second was performed which proved successful for about two years. After the birth of the eighth child the prolapse recurred. After having tried all kinds of palliative treatment the woman came to Dr. Knipe in June, 1906, for an operation for complete procidentia uteri. A supravaginal hysterectomy was performed with fixation of the cervical stump to the anterior abdominal wall, in conjunction with plastic work on the perineum. The operation was successful for a limited time, but, on account of hard work, the patient returned at the end of two years with the complete prolapse. Another operation was done at which the remaining portion of the cervix with the whole vagina was removed, the patient having considered this with her husband and consented to. This operation was performed at the Post-graduate Hospital in 1908 and consisted in the removal of the entire vagina including the portion of the cervix remaining after the supravaginal hysterectomy. The cavity left after the operation was closed by a series of purse-string sutures, beginning at the upper part of the wound and ending at the introitus vaginæ. The operation was not par-

ticularly difficult and there was but little postoperative reaction. The structural result was perfect and had remained so for three years in spite of the fact that the woman still worked very hard. There had been no tendency to recurrence and the patient felt perfectly well.

While this operation had a limited field of usefulness, there was no operation for this condition which gave such uniformly good results. While an operation which removed the vagina might with justice be criticised, there were, nevertheless, certain cases of prolapse which no operation, except such as had been described, would positively cure. In such cases the end justified the means.

DR. BOLDT said that it was true that the field for such operations as performed by Dr. Knipe was limited, but when the indications were as absolute as in the case reported, no criticism should be made, for it was the only operation in which a positive cure of the condition could be guaranteed.

A REVIEW OF SEVENTY-THREE CASES OF DUDLEY'S OPERATION FOR DYSMENORRHEA AND STERILITY.

DR. SAMUEL M. BRICKNER reviewed the history of this operation and described it in the words of its author as follows: "The operation has for its object the utilization of dilatation and of posterior incision of the cervix in such a way as not only to enlarge the caliber of the uterine canal, but also to straighten the uterus, and thereby to overcome the circulatory obstruction. The operation is performed as follows:

The uterine canal is dilated sufficiently to permit the introduction of the small sharp curet. Curettage is performed. The curettage may give only negative results, and may, therefore, be simply exploratory; or it may give evidence of pronounced endometritis. If the latter it is imperative as a preliminary aseptic step, not only to the plastic part of the operation, but also as a curative measure. The cervix is incised with scissors behind the median line, posterior to the uterovaginal attachment, nearly into the uteroperitoneal fold in the pouch of Douglas.

The cut surfaces thus incised are then held widely apart by means of the two tenacula in the hands of the assistant; the incision is somewhat deepened by means of a scalpel especially in the uterine wall next to the cervical canal, and a small angle is cut out on either side. The cut surface on each side is now folded on itself by a single silkworm-gut suture. This suture is tied and fortified by interrupted sutures on each side. By means of these sutures, the os externum is carried directly back to the angle of the incision. The cervix now points backward in its normal direction, toward the hollow of the sacrum, instead of toward the vaginal outlet.

When there was an unusually long anterior lip, this should be caught with a tenaculum, and partially removed with the scissors."

In the first gynecological service at Mount Sinai Hospital, this operation with some modifications had been performed 108 times in the past six years. The modifications had consisted of four factors, the principal one being the omission of the denudation of the anterior wall, which they had not considered essential to the proper development of the operation and which Dudley also now dispensed with. The second had been the occasional but infrequent omission of the excision of the wedge-shaped piece of the posterior lip of the cervix. The third consisted in the wide dilatation of the cervix, which rendered the operation easier. The fourth consisted in using chromicized catgut where Dudley employed silkworm gut to close the cervical wound.

The performance of the operation was simple and offered no technical difficulty. They had found it of advantage both as to speed and security to have the suture attached to the needle at each end, and to start the suture at the anterior or superior portion of the incision, tying it in the posterior fornix behind the cut edge of the cervix. In all of the cases the operation had been preceded by a thorough and prolonged dilatation of the cervical canal and a light curettage. The cervical dilatation was an essential feature as it permitted of the easier manipulation of the posterior lip of the cervix after it had been incised. They had often found it necessary to ligate a small branch of the circular artery of the cervix which was cut into when the wedge-shaped piece of cervical tissue was excised. One of the direct results of this operation was that the position of the os externum in the vagina was changed. Instead of lying against the anterior vaginal wall, if the uterus was in sharp ante flexion, or midway between the anterior and posterior vaginal walls of the uterus was moderately ante flexed, it now pointed toward the posterior wall. In this way the reception of the semen into the uterus was very much fostered. Another striking result was the change which took place in the curve of the uterine canal. Whereas before operation the uterus lay in very marked ante flexion, with a most marked curve, as soon as the suturing was completed the sound would be found to follow practically a straight course toward the fundus. This was so because the direction of the entire lower portion of the uterus was changed. While they had tried other measures for the relief of sterility and dysmenorrhea, this report dealt only with the result of the Dudley operation. In every case operated upon careful selection was made and an examination of the husband was made to preclude the possibility of his being responsible for the sterility. No patient was subjected to the operation who had ever had inflammatory pelvic disease, or in whom there was any gross pathological condition of the pelvis, or in whom there was diabetes, nephritis, tuberculosis, or grave cardiac disease. They had not considered a contracted pelvis as a contraindication, as patients with this condition could be properly taken care of when they became pregnant.

Although an infantile uterus did not offer a promising result, it was not looked upon as a contraindication to operation, since this might give relief to the dysmenorrhea. Many of the patients suffered from a nonspecific form of endocervicitis which had been recognized by Kelly as a source of dysmenorrhea. The majority of the patients gave microscopic evidence of a chronic endometritis although very few complained of leukorrhea. In general the patients presented themselves with a history of mere sterility, dating from eight months to twelve years. In their ward patients this was a serious complication of married life and if they remained barren they were eventually deserted or divorced by their husbands. The other general class complained only of dysmenorrhea. The usual finding was small anteverted uterus with a long conical cervix. In many instances the external os could not be passed by a sound and this constituted, in the absence of the contraindications above noted, an indication for the Dudley operation.

Dr. Brickner had made inquiry from the 108 patients operated upon and had received answers from fifty-two ward patients and twenty-one private patients, a total of seventy-three. He had received no response from thirty-three. The replies received from the ward patients showed that of twenty-nine who had applied for relief of dysmenorrhea, sixteen, or 55.1 per cent., had been relieved, while twelve, or 41.3 per cent., were not relieved; one was worse. Of twenty-nine who applied for relief of sterility, four, or 17.2 per cent., had been relieved, while twenty-four, or 83.8 per cent., had not been relieved. Delivery had been instrumental in 20 per cent. of the relieved cases and one had aborted. Among the private patients, thirteen applied for relief from dysmenorrhea and nineteen for both sterility and dysmenorrhea. Of those who applied for relief of dysmenorrhea, eleven, or 84.6 per cent., were relieved, and two, or 15.4 per cent., were not relieved. Of the nineteen who applied for the relief of both sterility and dysmenorrhea, 42.1 per cent. were relieved of their sterility, and eleven, or 57.9 per cent., were not relieved of their sterility. Of those who became pregnant, 15.8 per cent. were delivered by instrumental methods. It was evident that the private patients were much the gainers by the operation, both as to the relief of sterility and of dysmenorrhea.

Combining the statistics for the seventy-three patients they had as a result the following: Of those who applied for relief from dysmenorrhea, 64.3 per cent. were relieved, and 33.3 were not relieved; one was worse. For those applying for relief from sterility, 27 per cent. were relieved, while 73 per cent. were not relieved. Of the deliveries 8 per cent. were instrumental. It would be unfair to Dr. Dudley not to mention the fact that Dr. Ludwig Herzl from the clinic of Prof. Lott in Vienna had written a paper describing posterior sagittal dissection of the cervix as practised in Dr. Lott's clinic. There was essentially no difference between it and the method practised by Dr. Dudley;

the description read like a translation of Dr. Dudley's original article.

Dr. Brickner summarized his paper as follows: 1. Dudley's operation of posterior sagittal incision of the cervix with or without the excision of a bilateral wedge, for the relief of dysmenorrhea and sterility, was a procedure to be recommended. 2. It was of greater service in the relief of dysmenorrhea than of sterility, although in the latter class of cases the effect was sometimes magical. 3. The resulting scar in the cervix offered no hindrance to labor, dilatation being as normal as possible. 4. Pathological ante flexion, or retroflexion of a hypoplastic uterus, with stenosis of the external or internal os, or of both, was a frequent cause of sterility and of dysmenorrhea. 5. These conditions could be relieved in about 50 per cent. of properly selected cases by Dudley's operation, but no operation for sterility should be performed until the husband was found to possess living spermatozoa and no operation should be performed for dysmenorrhea without a thorough study of all the features of the case.

DISCUSSION.

DR. ROBERT T. FRANK had seen a large number of the cases Dr. Brickner had referred to and he could substantiate the statements made as to the value of this operation in selected cases of dysmenorrhea. Dysmenorrhea was relieved in a very large percentage of the cases, but the relief of sterility seemed to him to be rather doubtful. Though the statistics presented showed that only about 25 per cent. of the women were relieved, this was not to be placed to the discredit of the operation. The probability was that most women suffering from sterility had some condition not depending upon a mechanical form of obstruction. In his opinion mechanical obstruction played but a small rôle unless the obstruction was situated in the tube. Most of the other mechanical factors upon which attention was focused at the present day would sooner or later be recognized as negligible. All of them had met isolated cases of sterility supposed to be due to some mechanical factor; later these women became pregnant without operation. For instance, Dr. Frank recently saw a patient whom as a young girl he had treated for extreme dysmenorrhea by palliative measures. She was now married nine months. On account of vaginismus normal relations were impossible. Nevertheless she was now four months pregnant. Here there was not only the supposed obstructive factor which caused her dysmenorrhea to be reckoned with, but also an additional hindrance as the spermatozoa had to penetrate the introitus and ascend through the vagina and cervix before entering the uterus.

He recalled another striking instance, that of a woman who had been sterile for seven years and who had been advised to submit to a Dudley operation. The patient refused immediate consent, and now, three months later, she had become pregnant.

Again they were all familiar with cases of stenosis of the vagina; nevertheless many of these women became pregnant. In one such a case, which Dr. Brickner doubtless remembered, the upper part of the vagina had been reduced to a long tortuous sinus, barely admitting the finest probe. This patient promptly conceived. Coitus through the urethra, in cases of vesicovaginal fistulæ with obliteration of the introitus, were on record with resulting pregnancy. Here the spermatozoa had made their way through an infected bladder and false passage. It seemed to Dr. Frank that there were other causative factors that were more important and usually neglected. The chief factor, in his opinion, would eventually prove to be connected with ovulation. Probably there was a lack of coincidence between ovulation and the time during which the uterus was prepared to receive the ovum. As in animals, when certain pathological conditions were present, rupture of the follicles might be delayed until such a time that the uterus was no longer able to form a decidua for its reception. Dr. Reynolds had mentioned the fact that he could relieve, and had relieved, a number of women by operation, in whom he found microcystic ovaries; after perforating these cysts the patients had been relieved of their sterility. It was not the fault of the Dudley operation that success in relieving sterility did not follow, but it was rather, in his opinion, the fault existing, in some physical or pathological process, as yet undetermined, which caused a lack of synchronism between ovulation and the optimum time for the reception of the ovum in the uterus.

DR. JOHN O. POLAK knew of no conditions more trying to the practitioner than those of dysmenorrhea and sterility associated with antelexion of the uterus, and he knew of no operation that had given these patients such relief as the Dudley operation, or some of its modifications. He found after listening to Dr. Brickner's paper and looking at the diagrams with which the Dudley operation was illustrated that during the last few years he had been doing a modification of that operation. In the first place the operation they did was more extensive; they slit up the posterior lip of the cervix, using a Wylie or a Palmer dilator introduced into the uterus as a guide. In this way they made a clean incision through the posterior lip and internal os that was in perfect alignment. They then removed an extensive wedge out of each side of the posterior lip, placing their sutures in a manner similar to that described by Dr. Brickner, which placed the external os well back at the posterior cervicovaginal junction.

They were able to follow many of these women through pregnancy, and they had never seen any extensive cervical tears nor any trouble following labor after this modification of the Dudley operation was done. The character of the labor was not influenced by the operation, and the internal os would dilate far more readily than in other cases. He attributed this fact largely

to this: that after the Dudley operation, or some modification of it, the endocervicitis was cured so that cervical hyperplasia no longer continued. When the Dudley operation was properly done and cervical drainage instituted, the endocervicitis got well; this together with the fact that the cervix was placed in the seminal pool accounted for the sterility cures.

A point already mentioned Dr. Polak had noted many times; he found that women with marked dysmenorrhea complained of ovarian pain; the ovaries would be found to be sensitive and enlarged. He had opened the abdomen in such cases and found ovaries with thickened tunica. The earlier a Dudley operation was done the better effect it would have upon the circulatory conditions in the pelvis and better drainage would result. Tender ovaries, beginning to border on the pathological, might be relieved by establishing better pelvic circulatory and uterine drainage. Dr. Polak said that he had also done excision and incision of cysts; this too he found had a decided influence on pregnancy by allowing a better ovarian function.

It was now his custom to combine with the Dudley operation Reynold's procedure, separating the cellular tissues from the front of the uterus through a transverse incision at the utero-vaginal junction anteriorly.

DR. ROBERT L. DICKINSON said it was very important that much stress be laid upon the careful selection of cases. Restrict the operation to a limited field, the most extreme degrees of ante-flexion with fundus bent to cervix. The lesser degrees might have the uterine canal stretched in the office, or stems—the glass stem of Baldwin or his own stem—inserted, without having recourse to ether. It should not be forgotten that in doing this operation one was substituting one deformity for another. The point Dr. Polak brought out was very important. All bore short anterior vaginal walls. If there was a fairly good anterior wall a transverse slit was made and sewed. In 1 1/2 inch anterior walls use the operation of Reynolds; free the cervix from vagina by transverse incision and tilt it back.

Dr. Dickinson said he had used the stem for years for the relief of sterility and it was only recently that he had resorted to the Dudley operation. In a large class of cases, with a stem sewn in the cervix with a No. 22 wire passed anteroposteriorly, left six or eight weeks, there would result such a marked improvement in drainage as to give satisfactory results. But there was no doubt but that the number of relapses was considerable, particularly if one failed to follow up the cases for six months.

DR. SIMON MARX had done a few of the Dudley operations, and he had seen similar results from other means; he thought that he could give 25 per cent. of successful results, and even a greater percentage as for as dysmenorrhea was concerned by the ordinary methods. In practically all of the cases he had seen he had used the modified Wylie glass intrauterine stem which produced perfect drainage; this was used for months. Dr. Marx believed that

the cause of dysmenorrhea and the cause of sterility was mechanical. In the first place there was a marked flexion of the uterus, especially at the internal os; the best results, the most successful results, followed the stretching of the internal os as far as one could. The sphincter muscles should be paralyzed. He used a glass stem which had been thoroughly sterilized, and he got practically the same results as the writer of the paper. He admitted, however, that in some of the cases in which the glass stem was used he met with high temperatures.

DR. HERMAN J. BOLDT believed that the most striking features of the paper, in addition to the statistics given, was what Dr. Dickinson had already called attention to—the careful selection by Dr. Brickner of his cases. He said that Dr. Dudley was good enough to demonstrate the operation to him and a few others, shortly after he devised it, and Dr. Boldt had been doing it since. Every man was not careful enough in the selection of his patients for that operation. If the cases were properly selected, the operation of Dudley in the class of cases with a marked ante flexion, dysmenorrhea, and sterility, dependent upon mechanical obstruction of the cervical canal, would be a good operation. The operation devised by Pozzi is likewise excellent. Dr. Boldt emphasized the importance of selecting patients for operation rather than operation for patients.

DR. W. GILL WYLIE said that the operation had practically been done years ago by Dr. Sims and he had seen some of the cases where the results were good. Any man, however, who divided the internal os did serious harm to his patient unless it was completely and thoroughly dilated and stayed dilated for some time. One should dilate the os internum as fully as possible. There might be extreme cases in the treatment of which by this method failure would occur. One should fully dilvulse the canal, and insert a drainage tube which should remain for one, two or three months; this treatment should be repeated in six months giving the uterus time to develop. If this was done skillfully, one could guarantee a cure in nine out of ten cases of dysmenorrhea if there were no serious complications outside. These cases could be detected by examining them. If a sound was passed and this was not followed by bleeding and pain, the case was not a typical one of dysmenorrhea. Ten such cases would occur in private practice to one case in Bellevue Hospital.

DR. C. C. SICHEL said that many cases of dysmenorrhea and sterility were due to mechanical obstruction. Dilating operations usually resulted in a cure in those instances. Dudley's operation did not absolutely cure the condition or did it straighten the uterine canal in all cases. Dilatation and curettage should often be credited for the good results which followed the operation. In the limited number of cases where Dr. Sichel had performed the Dudley operation he felt that as the dilation and stretching of the spincter in the operation for hemorrhoids was a point of

paramount importance, so in Dudley's operation was the dilation and curettage.

DR. SAMUEL M. BRICKNER said there were many roads which led to Rome. He held no brief for this operation or other operations for the cure of dysmenorrhea. He believed, however, in reporting progress. He was a firm believer in this operation and he was at the same time aware that there were other methods which reached the same result. If he praised the Dudley operation, he did so because in his experience, it was fruitful and beneficial.

In answer to Dr. Fränk, Dr. Brickner quoted the words of the Pharisee: "I know, whereas I was blind, I now see." After the operation many of the women became pregnant within four or five weeks. This made him a firm believer in this operation; cause and effect, as in all biological relations showed that there was some definite relation one with the other.

In answer to Dr. Wylie, Dr. Brickner said that Dr. Sims never performed this operation, although, no doubt, his teachings had been influential in spreading bloody operations upon the cervix for dysmenorrhea and sterility.

RADIOGRAPHY OF THE DISTENDED (COLLARGOL, ARGYROL, OXYGEN) RENAL PELVIS AND URETER. (LANTERN-SLIDE DEMONSTRATION.)

DR. LEOPOLD JACHES and DR. H. D. FURNISS presented this communication. It was not an uncommon occurrence that the routine *x*-ray examination of the urinary tract failed to satisfy either the radiologist or his colleague who had referred the patient to him. Symptoms of obstruction, probably due to calculus, were present, but no calculus could be seen anywhere, and even the kidney shadow, which at present made its appearance on the *x*-ray plate with greater regularity than a few years ago, was normal in size, shape, and location. But the patient had the symptoms and wanted relief. The radiologist then commenced to look around for means of determining the cause and location of the obstruction. Thus the *x*-ray catheter was introduced; but this did not solve the problem. What was wanted was to make possible the reproduction on the *x*-ray plate of the renal pelvis and the lumen of the ureter and such constrictions as might be present. Bismuth was at first suggested as a ray proof substance to depict these organs. It was fortunate for the patients, however, that this had not been used, because in the experiments of Haenisch with bismuth injections of the kidneys of cadavers even persistent irrigation failed to remove the bismuth from the pelvis of the kidneys. In 1906 Foelcker and v. Lichtenberg published a report of several cases in which they used a 5 per cent. solution of collargol with very satisfactory results. Since that time argyrol had been substituted with equally good results.

Dr. Furniss and Dr. Jaches had employed the following technic: The patient was placed in the recumbent position on the *x*-ray table, cystoscoped, and the ureters catheterized. As soon

as the catheter reached the kidney pelvis, the patient, who was until then at the foot end of the table was pulled upward, and the x-ray plate placed in position. The Albers-Schoenberg diaphragm was then applied with moderate compression. The solution was gently injected until the patient began to complain of discomfort in the kidney, when the exposure was made; the injection was continued during the exposure in order to prevent the solution from escaping out of the pelvis. The time of exposure depended upon the individual case but was from two to eight seconds. They used either a 15 per cent. solution of collargol or a 40 or 50 per cent. solution of argyrol. Dr. Jaches said that from the radiographic point of view he could distinguish no difference.

The information to be obtained by this method might be summarized as follows:

1. The extent and shape of the renal pelvis, and its relation to the skeleton.

2. The angle at which the ureter entered the pelvis.

3. Constrictions in the ureter. In this connection they must be on their guard against mistaking a cramp-like condition in the upper portion of the ureter due to distention of the pelvis for a constriction.

4. Kinks due to displacement of the kidney. For a clearer demonstration of this condition, Foelcker from the start suggested placing the patient in the upright position and even attempted to adjust the Albers-Schoenberg diaphragm to the wall, but his attempts were admittedly failures. At the last meeting of the American Roentgen Ray Society, however, Dr. Stover of Denver, Colorado, showed radiograms of kinks in the ureter which were taken first with the patient in the recumbent position and then in the erect position. While the former showed the kinks quite distinctly, the latter emphasized that condition to a greater extent.

5. Renal tuberculosis and tumors. In a paper published by Dietlen of Strassburg in the *Zeitschrift für Röntgenkunde* for March, 1911, he showed a case of tuberculous kidney in which the collargol showed the extent of the caseation, and they believed that this method would help greatly in the diagnosis of renal tuberculosis and possibly of tumor.

In two cases in which they attempted to use oxygen for the demonstration of the renal pelvis this method had failed. Their opinion was that air or oxygen not being readily miscible with the fluid in the kidney pelvis, was not apt to give a true presentation of it. In the examination of renal tuberculosis suggested by Dietlen it would probably be of no avail, as it would hardly penetrate as readily into the areas of caseation. These considerations, however, were theoretical.

Dr. H. D. Furniss exhibited a number of radiographs made by Dr. Jaches and himself of the kidneys and ureters after injection with oxygen, argyrol, and collargol. In this collection were seen

radiograms showing mild and marked hydronephrosis, strictures of the upper and lower ends of the ureter, displacements of the kidneys, and in one the marked distortion of the renal pelvis due to a large hypernephroma of the kidney.

He thought that the good pictures were due to the team work between himself and Dr. Jaches, and considered such team work essential.

He and Dr. Jaches had tried out a number of different methods with a number of substances, and found that they got the best results with 40 to 50 per cent. argyrol (in a 2 per cent. boracic acid solution) injected with a piston syringe. They used a small ureteral catheter to allow the easy return of solution along side of the catheter, and to prevent overdistention of the renal pelvis. The injection started a minute before the exposure was begun, and continued during the exposure; this was necessary as the ureter was so readily emptied. The patient's face was watched for the least evidence of discomfort. The only cases in which there had been pain, had been those in which there had been some form of ureteral obstruction, and in these the pain had been of the type for which the examination was made. In two cases of dilation of the whole ureter, and in each of which a number of examinations were made on different days, there was absolutely no sensation in the renal region. This they regarded as evidence that any pain that may be experienced was mechanical rather than due to the irritating effects of the injected solutions. After the radiograph was made the excess of argyrol was allowed to run out of the catheter and then the pelvis of the kidney slowly irrigated with boric-acid solution, the return being along side the catheter.

In the instances where there was marked dilatation of the whole ureter, it was essential that the bladder be well filled if a picture of the ureter was to be had; otherwise the flow down the ureter was so easy and fast that the proper distention was not produced.

From the experience they had had with this method they believed that in cases with symptoms referable to the urinary tract in which other methods of diagnosis had failed to reveal the cause that such an examination was essential, and that a negative opinion was not possible until such an examination had been made.

DISCUSSION.

Dr. EUGENE WILSON CALDWELL thought that the subject under discussion was a very important one and those who had kept records of their examinations for ureteral stone had found calculi present in about one in every four examinations of patients who had submitted to the x-ray. The results in the other three patients examined would not help much in the diagnosis. Often one could tell something about the size, the outline and the position of the kidneys. Practically they could always say with accuracy what the size and outline of the kidneys

were. However, it should be remembered that the shadow of a normal kidney did not mean that the kidney itself was in a normal position, because in order to show a kidney shadow one must make a certain amount of pressure, and this compression nearly always replaced a prolapsed kidney. Therefore, one of the important uses of the injection of collargol in these cases, for they could look at the ureter and the pelvis of the kidney without making this compression, and the kidney itself would be outlined.

Dr. Jaches had spoken of the use of collargol, argyrol, oxygen and air; personally Dr. Caldwell had never seen any excuse for using air or gas; confusion arose because one could never be sure that there was not present gas in the intestine and there would be difficulty in distinguishing gas in the renal pelvis and air in an overlying intestine. Between the use of collargol and argyrol there seemed to be but little choice. In the Mayo clinic at Rochester, Minnesota, 650 patients had been examined in this way; they used 10 per cent. solution of collargol. There was some difficulty attending the making of this solution of collargol because there was likely to be a precipitate. Moreover, if argyrol solution was used, there was the danger of staining, a very disagreeable feature. The solutions used should be weaker. In making many of these examinations difficulty was often encountered for the conditions which made for *x*-ray examinations were not always favorable for cystoscopic work, and the success of these examinations depended upon the success in the use of the cystoscope. Most failures were due the failure to have the solution properly distend the renal pelvis.

DR. WILLIAM H. STEWART called attention to the advancements that had been made in this line of work, especially could it be appreciated if it was able to clear up the diagnosis in many cases of persistent renal colic which with the ordinary radiographic examination gave negative results. In these cases the indications were to examine the renal pelvis and ureters by means of the collargol injection looking particularly for kinks or obstructions.

Some surgeons had a certain amount of reticence about injecting in these cases, he had many times been refused the use of collargol; one surgeon did not wish it used fearing painful or disastrous results.

The speaker agreed with Dr. Caldwell that the real success in the work was good team work. Dr. Stewart's procedure was to make a preliminary radiographic examination, this tended to educate the patient as to what was coming from the apparatus, so that on further examination perfect immobility could be secured. If this examination showed a suspicious shadow in in the line of the ureter the question at once arose whether it was within or without the ureter. This was especially so in the pelvic region where so frequently shadows of the so-called phleboliths were seen. Given this condition, the speaker preferred to have an opaque or *x*-ray ureteral catheter passed for rad.o-

graphic examination *in situ*, rather than the use of a stilleted catheter or the injection of collargol.

If, however, the preliminary examination was negative and the symptoms persisted the indications were to inject collargol into the pelvis of the kidney and ureter with the possibility of finding an obstruction. Even with this method one might get negative results; there were a number of instances in which a kink was seen when the patient was in the upright position, but not seen in the recumbent position. This had been demonstrated by Dr. Stover of Denver Colorado, a number of times.

If the examination was to be of the renal pelvis, of course collargol was used immediately.

Dr. Stewart never set the compression diaphragm upon the patient before the injection of collargol as it was possible to produce pressure enough to interfere with the free injection and produce artificial obstructions. The cystoscopist commenced his injection first; when the patient complained of distention the diaphragm was set and the exposure made, gentle distention of the pelvis being kept up by his team mate.

Some improvement should be made in the cystoscope so that it could be removed after the panelled catheter had been passed without danger of pulling catheter with it. Patients often complained of the cystoscope remaining *in situ* during x-ray exposures. The speaker had seen expert cystoscopists neglect to lower the director on the cystoscope which gave them the sensation of having met an obstruction in the passage of the catheter, in one case causing great confusion as it was afterward demonstrated the shadow was outside the ureter.

DR EDWARD L. KEYES, JR., felt very uncertain regarding the interpretation of many of the pictures made, and it was very difficult to get patients to submit to the number of examinations required.

The functional test of the kidney was after all much more important for the preliminary diagnosis in patients with pus in the urine than the argyrol injection test. The x-ray and functional tests were requisites. If there was pus in the kidney as a rule the argyrol injection did not tell one anything of importance. Injection radiograms were only useful in the diagnosis of obscure renal pain.

Dr. LEO BUEGER said that the paper read by Dr. Jaches and Dr. Furniss was both of great interest and very useful, in that it brought to the attention of urologists in New York a method that had up to the present day found very little application.

There is an interesting group of cases that both the gynecologists and the urologists are frequently asked to treat, in whom the diagnosis is exceedingly difficult to make. The patients complain of pain in the back or lumbar or iliac regions; females are often operated for tubal or ovarian disease, or the appendix may have been removed. And still the symptoms recur. Cystoscopy and urethroscopy give negative findings. The urine may be clear without evidence of renal hematuria. In

such cases it is important to decide whether there is ureteral obstruction, a horseshoe kidney, or a mild hydronephrosis. The injection of methylene blue is not always satisfactory, but the collargol injection with subsequent radiograms is often of great value in demonstrating a dilated pelvis, a ureteral obstruction, or an anomaly.

As regards the recognition of calculi in the ureters, there can be no doubt but that the simple shadowgraph catheter is not as reliable in deciding as to the true nature of a suspicious shadow, as the method of pyelo- or uretero-radiography. Thus we may often be unable to pass an apparent obstruction in the ureter and cannot decide as to whether we are dealing with a true or a false occlusion. It is then exceedingly important to outline the ureter on a plate and this can be very well done if the following technic is employed. In such cases, if after the use of many catheters of various sizes, the obstruction cannot be passed, a catheter with lateral eyes, but with single opening at the end, preferably cut slightly obliquely, should be passed and firmly pressed against the point of resistance. When the injection is then made with the patient in a slight Trendelenburg position, we can in most cases, force the fluid beyond the obstruction and get a good outline of the ureter beyond the point of obstruction.

DR. EDWIN BEER said that, judging from the remarks of the previous speakers, they seemed to lay very little stress on the dangers incidental to pyelography. There were distinct risks with this procedure and he wished to emphasize that pyelography was not an innocent procedure. He believed that much more work would have been done along these lines had not the danger of severe collapses been experienced by most experimenters. He had seen three such cases; with such experiences fresh in one's mind, one naturally advised restricting pyelographic work to those cases in which it was strictly indicated. In addition to collapse necrosis of the kidney had recently been reported after the use of this technic. The class of cases in pyelography might serve a useful function were as follows: 1. Cases of suspected ureteral calculus where all other means had failed to make the diagnosis. In these cases the ureterograph would be capable of demonstrating a dilated ureter above a point of constriction, the site of the calculus. 2. In strictures of the ureter, ureterographs would be as useful as under 1. 3. In demonstrating dilated pelves, *e.g.*, hydronephroses due to mobile kidneys. In these cases, if the pelvic enlargement could be shown by injecting colored fluid through the ureter catheter and thus measuring its capacity, it was by far preferable to pyelography because less risk attended the work. He doubted very much the usefulness of pyelography to show the clinician the presence of a neoplasm which might distort the contour of the pelvis. No doubt such distortions occurred and were significant as had been demonstrated, but whether necessary to the clinical picture, whether essential to diagnosis, the future would have to show more definitely.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Renal Therapeutics in Some Obstetric Cases.—Angelo Conti (*Ann. de ostet. et gin.*, September, 1911) has made use of the internal secretion of the kidney, obtained by removing the serum from the renal vein of the goat, in experiments as to its effect in pregnancy. Teissier thought that the internal secretion of the kidney was complex; it had a stimulating action on the renal tubular epithelium and glomeruli which increased diuresis; also a neutralizing effect on cytotoxins and nephrotoxins secreted by the epithelium in a condition of disorganization, and an indirect antitoxic action which freed from their combination with the chlorides the toxalbumins retained in the tissues, and favored their elimination by the natural emunctories. The experiments of the author were made in the Milan Obstetric Institute, where he treated two cases of pregnant albuminuria, two cases of chronic nephritis, one of chronic nephritis and uremia, and one of poisoning of the kidneys with corrosive sublimate. While under treatment the régime was strict and no other remedies were used. The histories of the six cases are given in detail. The author concludes that the serum of the renal vein of the goat causes lessening of albumin in the urine, and increases diuresis and the permeability of the kidneys for chlorides. Its clinical results are lessening of headache and production of a condition of buoyancy of feeling and good general condition. If the remedy be stopped these improved conditions will not continue. The edema is slowly absorbed, dyspnea becomes less, the pulse improves in rhythm and fullness, arterial tension is lowered, and digestive disturbances lessen. This remedy appears to be perfectly harmless.

Chemical Experiments with a View to Determine the Active Principles of Ergot.—Alfred C. Crawford (*Bull. gén. de thérapeutique*, Sept. 30, 1911) says that recent observations have modified the views held as to the active principles of ergot. The principle that contracts the unstriated muscle fibers is not the same which affects the cyanosis of the comb of the cock. After giving a history of the researches already made the author describes his own tests. His conclusions are these: there are two alkaloidal substances in ergot. The specific alkaloid ergotoxin exists in very small quantity, but to it we cannot attribute all the effect of the drug. We would like to know whether this effect is not due to a body of the group of amines. Ergot owes its activity to basic amines and only fresh ergot is officinal in some pharmacopeias; ergot rapidly degenerates and loses its therapeutic activity by forming trimethylamine. It is very

difficult to establish the difference between various specimens of ergot which have different effects on the uterus.

Incidence of Placenta Previa in Manila.—H. A. Sison (*Bull. Manila Med. Soc.*, 1911, iii, 154) emphasizes the very high incidence of placenta previa among the poorer classes of Filipino women. He records twenty-two cases, of whom seven had previous abortions and of the nineteen cases that were examined, fifteen had retroversions, and three had previous subinvolutions. Of the four primiparae examined all had retroversions. The majority of the single women examined in the gynecological dispensary of the Philippine General Hospital have retroversions. The frequent occurrence of retroversions in young Filipino girls, especially in the lower classes, is probably accounted for by the usual custom of allowing girls of seven to ten years of age to be the nurses for their young brothers and other relatives. These children also often have responsibilities of housework, carrying heavy baskets to the market and attending the younger members of the family. Excluding the case of a woman who was found dead on arrival and three still-born babies undergoing putrefaction at the time of birth, the writer's twenty-one cases showed a maternal mortality of 19.04 per cent., and a fetal mortality of 66.66 per cent. He believes that the high frequency of placenta previa in Manila and its relative frequency in primipara as compared with other statistics is partially accounted for by the large percentage of uterine malpositions and subinvolutions leading to endometritis. The prognosis of central placenta previa when the bleeding is excessive is grave and unless timely interrupted is fatal to both mother and child. The use of a dilating bag in an undilated cervix where the fetus is viable, and the procedure of slow delivery according to Braxton Hicks' method in a nonviable fetus insures a better prognosis for the mother by preventing cervical tears. Physiological salt solution introduced by rectum, under the skin or intravenously favors the recovery of the patient. Babies delivered from mothers dying of acute anemia are born dead. An effort at delivery while the patient is in bad condition hastens the death of the mother.

Use of Pituitrin in Obstetrics.—C. Hahl (*Finska Läkaresällsk Handl.*, 1911, liii, 336) reports briefly thirty-four cases in which this treatment was employed in the obstetrical clinic at Helsingfors. Thirty of these were followed only clinically, but in four the character of the pains and the intervals was studied with the apparatus of Westenmark. Among the first were two Cesarean sections in one of which the injection was made directly into the uterine muscle. In twenty-two of the thirty there was a very favorable effect; in six it was distinct but not as marked; in two no result was observed. In some of the cases the pituitrin injection was given at the onset of labor; in others, near its end. The author tabulates the duration of pains and intervals and the corresponding intrauterine pressure in millimeters of mercury in the four cases studied instrumentally. He finds that in some cases the hypo-

physial extract has no effect in some cases, but in others excites regular and powerful pains which remained of constant strength for ninety-six minutes and then weakened. In two cases the pains became shorter but stronger, the intervals of less duration and the intrauterine pressure higher. The pains in these cases became more tetanic, although the dosage of pituitrin was not over 0.7 gram. On account of idiosyncrasy the writer advises as an ordinary dose 1 gram, repeated if necessary.

Abscess of the Uterus Following Labor.—C. R. Robins (*Old Dominion Jour. Med. Surg.*, 1911, xiii, 277) records a case of abscess of the uterus in the posterior part of the right horn of the uterus with no communication with the tube or cavity of the uterus. The endometrium was normal. The writer notes chiefly the absence of the usual etiological factor, puerperal infection. In this case there was no temperature until three weeks after delivery. The adherent appendix would suggest this as the possible causative factor. The patient had suffered from a dull right-sided pain for many years and in the absence of other pelvic findings we might reasonably ascribe this to a chronic appendicitis. The physical findings in this case were the same as are usually noted, an irregular outline of the uterus similar to that found in fibroid of the uterus.

Passage of Metallic Poisons from the Mother to the Fetus.—Giovanni Petrucci (*Ann. di ostet. e. gin.*, Oct., 1911) tested the passage of several metallic poisons from the mother to the fetus in guinea-pigs; the poisons used were lead, phosphorus, arsenic, and mercury. The results showed that the mother in all cases had alterations of the internal organs proportional to the length of time of the administration of the poison. Both liver and kidneys were altered. The fetus always had similar changes in liver and kidneys, mercury giving the least alterations. The kidneys were less changed than the liver. In slight poisoning the lesions in the fetus were more severe than in the mother. Thus we see that these poisons pass rapidly from the mother to the fetus whatever be the conditions as to duration and amount of poison. The liver bears the brunt of the alterations in the fetus because here the poisons must pass through the organ, while in intrauterine life the kidney has not begun to functionate.

Rupture of Ovarian Cysts in Pregnancy.—Erocle Cova (*Ann. di ostet. e. gin.*, Oct., 1911) has collected eleven authentic cases of rupture of ovarian dermoid cysts during pregnancy, and to these he adds a personally observed case with its history. After considering these cases he concludes that rupture of an ovarian cyst in pregnancy will be fatal if not operated on, since the contents of the cyst will bring about peritonitis if left alone. When operated on during pregnancy the results may be good if operation is not delayed too long. Of the eleven collected cases three died. The dangers are greatest when the material from the cysts remains for a long time in contact with the peritoneum. In two unoperated cases death followed; of nine cases operated

on eight recovered. The operation should be undertaken as soon as the diagnosis is made, and the coincidence of pregnancy is not a contraindication to operative interference.

Physometra with Rigidity of the Cervix Uteri.—A. Bonnet-Labordière (*Jour. des sci. méd. de Lille*, Oct. 28, 1911) says that physometra is an accumulation of gas in the uterine cavity in pregnancy. There are needed for its production, two factors, bacterial action, which may arise from the bacteria that are habitually found in the vagina, especially the anaerobic ones, and a culture medium. The latter may be furnished by putrescible material, such as placental remains, clots, pieces of membranes, a dead fetus, etc. Ordinarily the membranes prevent the entrance of germs from the vagina; but when they have prematurely ruptured the necessary condition arises for the production of gas in the uterus. When this has occurred the uterus becomes tense, and on percussion gives a clear sonorous note. There is a flood of fetid lochia from the vagina. Such a case may be a presentation of the shoulder with a premature rupture of the membranes. The author recites a case in point in which a toxic paralysis of the uterine muscular fibers is accompanied by a true tetanus of the uterine muscle. After rupture it is not prudent to wait too long for contractions lest fetal death occur and putrid gas accumulates in the uterus.

Eclampsia without Convulsions or Unconsciousness.—H. H. Schmid (*Zeit. f. Geb. u. Gyn.*, Bd. lxxix, H. 1, 1911) says that the typical changes in the internal organs in eclampsia are degenerative processes in the parenchyma of the kidneys and especially in the epithelium of the tubules, with production of albumin and fat, and local degenerative necrosis; in the liver, hemorrhagic necrosis with thrombosis of the capillaries and the inter- and intralobular vessels; hemorrhage and softening in the brain, membranes, and central ganglia, with thrombosis of the small vessels; albuminous and fatty changes in the heart muscle and hemorrhage and necrosis of these tissues. There are cases of puerperal poisoning in which convulsions and even coma are entirely absent, that still are cases of the kind of poisoning that causes the symptoms of eclampsia. The author describes such a case with only slight albuminuria and swelling of the ankles, which died, and at autopsy showed these characteristic changes in liver, kidneys, and brain. The author also cites twenty-four cases similar to his own. There were premonitory symptoms of eclampsia, but these were not followed by convulsive seizures or coma. There were relatively often anomalies of the placenta necessitating interference. The prognosis for the child was better in the cases that recovered than in those which died. The author concludes that there is a characteristic pathological condition in eclampsia; when this is found postmortem we must conclude that the case was one of eclampsia even when convulsions and unconsciousness are absent.

Hemolysis of Streptococci in Vaginal Secretion of Pregnant.

and Puerperal Women.—A. J. M. Lamers (*Arch. f. Gyn.*, Band xcv, Heft. 1, 1911) has made a study of the property of hemolysis by streptococci in the vagina of pregnant and puerperal women, and gives his conclusions. He tested the secretions of twenty-one women in the puerperal state. He finds, in the genital secretion and on the vulva of pregnant women, hemolytic streptococci. The finding of hemolytic streptococci in the genital secretion cannot be accounted for by the increase during pregnancy of the variety usually found; nor can we think that these germs are carried into the genitals by the examining hand, nor can they come by ascending from the vulva during or after labor. We cannot account for the presence of hemolytic streptococci in the uterus by the carriage of these germs from one patient to another. We find in the genitals of pregnant and puerperal women transition forms between hemolytic and nonhemolytic streptococci. The hemolytic streptococci found in women who are free from fever arise from the nonhemolytic type. The hemolytic streptococci which produce fever in the puerperal state develop from streptococci brought from without the patient. That streptococci are hemolytic does not show that they are pathogenic. It is simply an indication of better growth conditions.

Pituitrin as a means of Arousing and Increasing the Contractions of Labor.—H. Fries (*Münch. med. Woch.*, Nov. 14, 1911) believes that pituitrin is reliable for arousing and increasing the force and frequency of the contractions of the uterus in labor. While it should not be used if there is any other obstacle to the conclusion of labor than inertia, in slight degrees of pelvic contraction it has been of great assistance in causing the engagement of the head. Some observers have found it ineffective in postpartum hemorrhage; but the author thinks that he has seen excellent effects from it in the delivery of the placenta and prevention of subsequent hemorrhage.

Exstrophy of the Bladder in a Parous Woman.—H. B. Schmidt (*Phys. and Surg.*, 1911, xxxiii, 372) reports a case of exstrophy of the bladder with a gap of about 7 centimeters between the pubic bones. The patient has been married for nine years and has borne two children. The writer has found six recorded cases of child-bearing by women with this lesion.

Relationship of Fibroids to Sterility.—E. B. Young (*Bost. Med. Surg. Jour.*, 1911, clxv, 836) bases his paper upon 238 cases of fibroids in married women. He says that the percentage of primary sterility among married women with myomata (about 31 per cent.) is greater than the average for other women (about 10 per cent.). Women with fibroid tumors of the uterus bear fewer children on the average than women with normal uteri. Patients with myoma a, on the average, cease childbearing earlier than others. As a corollary to these conclusions it appears that there is a secondary sterility in certain instances, which results from the development of a fibroid in a patient who has previously borne children. Although sterility is more common in women who

have myomata, these tumors do not always prevent conception or even repeated pregnancies. The exact manner in which fibroids produce sterility remains undetermined. Miscarriage occurs in 44.7 per cent. of the cases where conception does take place.

Venesection in the Treatment of the Preeclamptic State and of Eclamptic Seizures.—M. Potocki (*Jour. de méd. de Paris*, 1911, No. 45, 873) thinks that in the classical treatment of eclampsia, by means of chloroform inhalations, chloral and drastic purgatives, with milk diet, and abstention from all obstetrical interference until dilatation is complete, we have much to deplore. He thinks that the chloroform increases the intoxication of the patient on account of the poisonous action on the liver and kidneys, the emunctories which should carry off the poisons. Jaundice is apt to occur in eclampsia after the use of chloroform, and has even been seen in laparotomies after its use. In all gravidic intoxications with albumin in the urine and eclampsia there is increased arterial tension. To this are due the multiple hemorrhages external or visceral which are observed in the intoxicated, and also the hypertrophy and dilatation of the heart. To lessen the arterial tension is one of the objects of treatment in eclampsia. Often the purple, congested face of the eclamptic indicates the need of venesection. In albuminurics who are suffering from severe headaches, and pains in the back and kidneys leeches and wet cups applied to the head and back have relieved the symptoms. In several such preeclamptic cases venesection has been used by the author with success; headache has been relieved, arterial tension lowered, and the expected eclamptic attacks have not taken place. Some of the products of intoxication have been removed with the blood taken away. Tarnier says that every prealbuminuric woman may be relieved of her symptoms by a week of milk diet. But we cannot always wait a week for relief, and convulsions may come on before the week of treatment has passed. In the patient who has already begun to have convulsions venesection is not too rapid in its effects. Still generally the crises cease or lessen in frequency, and the patient becomes calm. A second venesection may be done if they return, 600 to 1000 c.c. being removed. The preeclamptic patients treated by venesection were delivered of living children and mortality was nil. The author advocates venesection in all eclamptic and preeclamptic cases.

GYNECOLOGY AND ABDOMINAL SURGERY.

Menstruation.—Josef Halban (*Zeit. f. Gyn.*, Nov., 1911) has studied the occurrence of the rut in frogs in which castration had been performed. He finds that the rut appeared at the usual time, although in less degree than in normal frogs. From this he concludes that in frogs the genital glands are not the causation of the rut, but that there must be some outside causative force at work. In women who have had both ovaries removed indications of menstruation are still present. Often soon after the

removal of the ovaries there is a profuse menstrual period, and several of them may occur. Even when it does not appear there may be bleeding from the nose or the intestine. At the time when the period should appear there may be headache, backache, and other symptoms irregularly between the periods. The author concludes that we have herein evidence that it is not the ovaries that cause menstruation, but that there is some other as yet unknown cause for that phenomenon.

The Relation of Menstruation and Ovulation.—L. Fraenkel (*Zeit. f. Gyn.*, Nov. 18, 1911) had studied ninety-five operative cases in which the operations were performed for causes outside of the genital organs, and in which these organs were healthy. In these patients operated on by laparotomy the author observed the condition of the corpus luteum in the ovary with reference to the previously ascertained last menstrual period. He tabulates his results. He found that women who were operated on during the menstrual period never showed a corpus luteum. In forty-three women he saw a fresh corpus luteum. He never found a perfect corpus luteum ten days after menstruation. He concludes that ovulation does not occur in the postmenstrual or the immediately premenstrual period, but in the interval between them, and in its second half. The fourteenth day after menstruation is the probable date for the completion of the corpus luteum. Ovulation and menstruation do not occur together, but have a precise relation.

The Transverse Suprapubic Incision in Gynecology.—Pol. Coryllos (*Rev. de Gyn.*, Oct. 1, 1911) says that the transverse suprapubic incision is much in use in Germany at present, less so in France. The author speaks especially of the transverse suprapubic incision of the skin and aponeurosis of Pfannenstiel, which he describes. This is indicated in 90 per cent. of laparotomies for gynecological troubles. Its advantages are that it gives more room and light than the longitudinal incision, gives better access to the lateral parts of the pelvis, allows of better preservation of the intestines and better manipulation of the serous membranes. There are no difficulties of drainage, and it absolutely prevents eventrations. The cicatrix is perfectly concealed in the folds of the abdomen, and it may be combined with the Alexander-Adams operation in hysteroperies. The patients may be allowed to get out of bed early; its morbidity and mortality are less than with the longitudinal incision. Its inconveniences are long hemostasis, hematmata, suppuration, and difficulty of extracting large tumors.

Teratoma of the Ovary with Giant Cells.—Tapie and Meriel (*La Gyn.*, Sept., 1911) reports a case of teratoma of the ovary in which there was found a considerable amount of tissue covered with long blonde hair, and a fragment of bone with several teeth implanted in it. In the tissues of this same specimen were found giant cells. The author says that there are degrees of complexity in these growths varying from simple dermoid cysts to double

monsters. The authors classify them into teratoid tumors and true teratomas. The first class consist of monstrous embryos, the tissues being recognizable only under the microscope. The second show rudiments of organs visible to the naked eye. The most plausible theory as to their origin is the blastomeric, according to which there is a vice of development of the primitive ovule, in the early stage of segmentation. A segmentation zone becomes separated from its place in the main embryo and becomes a separate imperfect embryo with multiple tissues within the primary one. They are more complex as the separation occurs earlier in development.

Use of the Balloons of Champetier de Ribes in the Treatment of Vaginismus.—M. L. Funck-Brentano (*La Gyn.*, Oct., 1911) has made use with very good results of dilatation under anesthesia, by means of the inflated balloons of Champetier de Ribes. He inflates them in the vagina, and under chloroform extracts them while inflated, at the same time removing all traces of the hymen with scissors. At first the balloon of 5 to 6 cm. in diameter is introduced, then a larger one. One must be careful to avoid tearing the walls of the vagina, because the tissues are not easily stretched and not only the constrictor of the vagina, but all the muscular apparatus of the region is involved in the contraction. The balloons are extracted slowly. The orifice of the vagina looks like that after delivery; there is relaxation of the muscles and an open vulva. The vagina is tamponed with gauze, any tears are sewn up, and on the following days vaginal injections are given twice daily, morning and night, with larger and larger round canulas. In one case delivered after this operation the labor was like that of a multipara. The results are excellent.

Local Anesthesia of the Uterus by Cocainization.—M. Febres (*Presse méd.*, Oct. 14, 1911) says that for many operations, both in gynecology and obstetrics, local anesthesia of the uterus by injection of cocaine into the cervix is useful. The author calls the process metrococainization, and thinks that it is not dangerous. The cervix is grasped and held in place with forceps, and four injections are made into the anterior and posterior lips, and on each side, injecting an amount of the warm solution equal to 4 centigrams of cocaine hydrochloride. Perfect anesthesia is obtained in four to five minutes. Among the operations for which this method is used are intrauterine explorations, curettage, incision of cysts, trachelorrhaphy, dilatation of the cervical canal, cystocele, prolapsus, etc. It may be used for rapid evacuation of the uterus, removal of retained membranes, dilatation of the rigid cervix, etc.

Absence of Premonitory Pulse or Temperature Rise in Thrombosis or Embolism.—Hermann Küster (*Zeit. f. Geb. u. Gyn.*, Bd. lxxix, H. 1, 1911) says that the active treatment after operations and labor, and the early rising have not lessened the frequency of phlebitis. In pure pelvic thrombosis there is a feeling of induration in the broad ligament, but in thrombosis of the saph-

enous vein, which so easily extends into the vena cava, we have no such assistance. The author has observed between 1905 and 1910, fifty-four cases of thrombosis and embolism in the Frauenklinik at Breslau. He divides them into three groups: pure thrombosis; thrombosis with embolism; and embolism without clinical symptoms of embolism. Of these cases the author gives the histories and tabulated chart with temperature curves. From this work he deduces these conclusions: there is no premonitory rise of temperature or increase of pulse rate before thrombosis and embolism occur that is at all characteristic, and indeed none occurs except rarely. We cannot know from any symptoms that thrombosis has taken place or an embolus is about to be detached, and we must still go on seeking new signs to warn us of these untoward operative results.

Treatment of Syphilis with Salvarsan.—A. L. Wolbarst (*N. Y. Med. Jour.*, Sept. 16 and 23, 1911) finds that of fifty cases, studied clinically for periods varying from three to ten months (an average of 6.4 months), after a single injection, twenty-seven (54 per cent.) may be considered clinically "cured"; ten (twenty per cent.) improved materially, and have not yet suffered recurrence; ten (20 per cent.) improved, but developed clinical recurrence later; three (6 per cent.) showed no change as a result of the treatment. When clinical recurrence took place it occurred most frequently in the first three months after treatment. Evidently one injection was not sufficient to produce the desired result. One case recurred after seven months, and one after eight months. Repetitions of the treatment should be given within one month, to insure the best results. The Wassermann reaction remained positive in 33 per cent. of the cases, and became negative and remained so in 30 per cent. of the cases for periods averaging four to five months. In the cases considered "cured," the reaction became negative in 41 per cent., and remained positive in 30 per cent.; in the cases which improved without recurrence, 40 per cent. became negative and 20 per cent. remained positive; of the cases improved, with recurrence, 30 per cent. became negative and 50 per cent. remained positive. This showed that the Wassermann reaction is more likely to change from positive to negative in cases which also respond clinically to the influence of the remedy than in cases which do not show this favorable result. The positive reaction is apt to remain uninfluenced in cases in which clinical recurrence takes place. In the primary cases the reaction became negative in 33 per cent., and remained positive in 50 per cent. of the cases; in the secondary cases the reaction became negative in 50 per cent., and remained positive in 36 per cent. of the cases; in the tertiary cases the reaction became negative in 15 per cent. and remained positive in 22; in the parasymphilitic cases the reaction became negative in 50 per cent. and remained positive in 40 per cent. of the cases. The therapeutic effect of a single injection of salvarsan is equivalent in potency to a course of mercury and iodides, in a

large proportion of cases. This is particularly true in primary cases and in cases which have not responded previously to vigorous treatment with mercury and iodides.

Venereal Prophylaxis in Large Cities.—G. L. Eaton (*Pac. Med. Jour.*, 1911, liv, 665), President of the Health Commissioners of San Francisco, describes the means employed in that city to minimize the spread of gonorrhea and syphilis. On Mar. 21, 1911, a clinic was established, consisting of an outer office where cases enter for examination, a clerical office, a waiting room for those to be registered or examined, seven examination booths, equipped with surgical tables, etc., a complete bacteriological department for the microscopical findings, and another waiting room known as the detention room, where cases are detained pending the bacteriological report. The force consists of one chief clinician with three assistants, one bacteriologist, a head nurse with one assistant, a matron and a janitress, one superintendent and two assistants. A complete record and identifying system is maintained for the purpose of keeping a tabulation of each case. Each applicant upon being recorded is charged fifty cents and a receipt in duplicate is given which entitles her to an examination and free treatment if found diseased; otherwise she is given a small book folder with picture, name, description, and date of examination which permits her to become an inmate of a house of prostitution, the mistress of the same having previously received instruction through the police department that all inmates must produce credentials showing that they have been to the clinic and are free from infection. If, by chance, the mistress permits a girl without a book to ply her trade, the place is closed for one week, on a second offence, her place is closed for good, as it exists only by virtue of tolerance. The clandestant, are prosecuted through the police court in such a manner as to set examples to all who refuse to obey the mandates of the Police and Health Department. All infections of a venereal nature are reportable, thereby giving to the Health Authorities a clue to the source of infection and in many instances, the individual is arrested as a suspect of being the carrier of an infectious disease. Such examples have proven very beneficial, in compelling a more liberal patronage of the clinic by this class, who predominate in all cities that claim to have eradicated houses of ill fame and who habituate known houses of prostitution. The writer tabulates the results obtained during the first three months, showing the number of women examined, number of examinations made, and cases of syphilis and of gonorrhea found, also the morbidity record of the navy yard and presidio during this period. The reduction of infections shown is so great that the writer earnestly advocates the enactment of laws for the legal recognition of prostitution and giving to health authorities full and unrestricted control over it.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

ETIOLOGICAL FACTORS IN EXCEPTIONAL CHILDREN AND THEIR PREVENTION.*

BY

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THE tidal wave of humanitarianism has taken due cognizance of the previously neglected physical and mental condition of children, yet it would seem that hardly anything of importance has been done at the same time to lay bare the mysterious causes that are essential in the production of the exceptional child. While it is true that by proper education of the mind and body of the child we are insuring better generations, yet it is equally true that by neglecting those which are still producing the exceptional child, we offer no check to the constant influx of this social evil. It seems to me important that a thorough discussion should be had of the causes that are responsible for the production of the many children that come into the world handicapped and either illy prepared or not at all able to take up the tasks devolving upon them from the beginning of the school age, through their adolescence, and in adult life. These unfortunates are not only handicapped themselves but are a telling burden upon the community in which they live. It becomes evident, therefore, that we must turn our attention primarily more to the conditions productive of the exceptional child, than to the exceptional child itself, and thereby find means of eradicating the causes, when the evil will naturally disappear. By this I mean that we must study the conditions surrounding the parents that are primarily responsible for the nature of their offspring, and it is upon this question that I shall touch in the short paper I am privileged to present to you to-day.

The etiological factors, then, that are responsible for the pro-

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duction of the exceptional child can be divided into two classes:

1. Hereditary.
2. Acquired.

It is an accepted fact that hereditary taints are transmitted from generation to generation. This is strikingly emphasized in offspring resulting from consanguineous marriages, where if there are any deleterious factors in the family, these are brought out more promptly and certainly. What ill effects are noted in consanguineous marriages are due to the operation of some hereditary defect which is present in the families of both parents and this tends toward deterioration of the offspring.

A very potent factor in the production of handicapped children are marriages contracted either too early or too late in life. Insanity is too often the result of a morbid heredity, and if present in either parent will exhibit its influence upon the offspring either as insanity or as some closely allied psychosis or a neurosis in later life.

While this does not mean that every child resulting from such marriage would be prone to be insane, all of them will certainly inherit either a neuropathic or psychopathic constitution, upon which under favorable circumstances—and these are too numerous in our highly complicated social fabric—some form of mental deterioration will manifest itself and thereby render the mind decidedly unstable if not exactly insane. This is true when one or both parents are insane, as well as when there is insanity in the heredity of either parent. In other words, while one does not inherit insanity, a mental instability is certainly inherited just as is a physical point of minor resistance.

A case in point is the famous Jukes family in New York state—intermarrying only with their defenerate kind, as they did—produced nearly three hundred-odd criminals, paupers, prostitutes and feeble minded. This is true also of other nervous manifestations which, while not to be properly classed as insanities, yet are diseases of the nervous system and manifested in generations of the same family. This holds equally true in inherited physical defects for, while no particular disease is propagated to remote generations, a child may inherit a tendency in certain tissues to develop a certain disease under favorable circumstances. Such physical disabilities would tend to handicap a child to a certain extent as much as acquired mental disability. For example, a predisposition to acquired tuberculosis, it is a well

established fact, can be and is inherited through generations. Even congenital abnormalities which are entirely consistent with life, but which may prove a certain handicap to the individual, may be transmitted and become more or less a feature of a particular family.

In factors acquired by parents which tend to deteriorate their offspring, I would include alcoholism, tuberculosis and specific infections. While the study of the possible influence of alcoholism has received much attention, the results have not proved entirely satisfactory. The reason for it is that the subject is one of the deepest human interest and has not always been approached scientifically or with a strict attention to its medical aspect. Investigators of this subject have been greatly influenced by preconceived notions and erroneous impressions, so their opinions of these unnecessary and unfair factors and conclusions have been distorted by personal feeling or belief, and results were, to say the least, inaccurate. I was personally placed in a rather disagreeable position a few years ago, when I pointed out that the use of alcoholic beverages was responsible for their handicap in about 70 per cent. of the backward school children, and you all remember the outcry that was raised against a physician only three years ago who pointed out that 20 per cent. of our school children are using alcohol in some form or another. So that one can appreciate the predicament that one is placed in when attempting to investigate conditions of alcoholism in parents.

The limited time of which I feel at liberty to avail myself will not permit me to go extensively into the discussion of the experiments with alcohol made by numerous investigators upon animal life, but I can safely say without fear of contradiction that alcohol, even in small quantities, frequently used, affects the protoplasm and therefore the entire system. It lessens the absorption of oxygen by the red blood-corpuscles and the exhalation of carbon dioxide, thus producing a toxic condition. It not only diminishes our powers of resistance but favors the growth of many pathogenic organisms. It inhibits to a great extent the metabolic changes in every organ of the body.

The decrease or increase of mental disorders and crime in a community are shown by statistics to be in direct proportion to the rise and fall of the consumption of alcoholic beverages. It is one of the factors, if not *the* factor, which produces a lesser resistance in all tissues and exposes our system to the acquirement of the various mental and physical disorders.

I do not believe that alcoholism is directly transmitted by the parent to its offspring, but it has been shown that conceptions while in a condition of alcoholism have resulted in 50 per cent. of the cases in death of the fetus, and those that survive become moral perverts and degenerates.

Since the mother has a greater share in the life and care of the child, maternal alcoholism is of far greater danger than paternal. It has been proved time and again that the earlier in her pregnancy a woman takes to drink the more certain will be the debility of her offspring. The sobriety of the father has practically no influence on the mental development of the offspring of a maternal drunkard. Bourneville made a close study of 2,554 children who were classed either as idiots, epileptics or imbeciles, or who suffered from some form of neurosis, and of these he found that 1,053 had an inebriate parentage. In 933 it was paternal; in eighty, maternal, and in forty it was traced to both; 235 were conceived during paternal drunkenness.

We may therefore conclude that paternal intemperance, if not itself due to a neurotic heredity, and especially if emphasized by disease or privation, certainly produces a marked influence upon nutrition and causes mental and physical degeneration, both in the parents and in the offspring, and is really a prime cause of idiocy, feeble mindedness, mental or moral deficiencies.

The two other factors which I have mentioned, tuberculosis and specific infections, which are found to a great extent in alcoholics, are also found in many others than of a known alcoholic tendency. That these physical elements are deteriorating the body of their victim, and that such deleterious effects will manifest themselves in the child in a lowered mental stability, no one will dispute to-day. The toxic condition generated in the mother by these deleterious agents certainly exerts an ill effect upon the offspring, and thereby certainly interferes with its perfect development.

While the offspring does not inherit tuberculosis it does inherit a predisposition for that disease. Of specific infections we can say that some inherit syphilis, but among those who do not inherit this disease, they, as well as the others, do inherit some form of mental instability, which under certain conditions of later life prove a handicap to the child. Not only may this child be handicapped by mental instability but also by deformities or structural weaknesses which are frequently so great as to make early death preferable.

From the few instances I have pointed out, it would seem that if ways and means could be found to minimize these conditions, we could certainly achieve far better results than by simply directing our attention to the handicapped child. While the problem of educating parents would appear to be a very indirect one, it seems a simple matter if we would strive to create ideal social conditions for these unfortunates. By this I mean that the wage earners, which are the great bulk of the social organism, should be given a chance to live in ideal homes as well as to make a fairly comfortable livelihood under ideal conditions, in the factory.

Poverty may not be a shame for a particular individual, it certainly is a shame to the community. By minimizing these choice combinations of degrading influences which we call poverty, we would not only diminish the chances of those born below par from being starved into criminality or distorted into cripples, or overworked and overcrowded and driven into consumption, infected with blindness, or given over to insanity, but also those who are born healthy and normal as well.

Consanguinity in marriage should be restricted by legislation to far greater extent than is done by any church or creed.

It should be made compulsory for everyone applying for a marriage licence to undergo a thorough physical examination by expert observers. Should the applicant exhibit any of the above enumerated affections, he or she should be forbidden to contract marriage.

The appointment of an inebriety commission in our city seems to me a beginning at the wrong end. What we ought to do is to restrict the sale of liquor by making it a dearly bought luxury. The welfare of our community should be placed above the material interests of the manufacturers of alcoholic beverages. The proprietor of a resort where one is found intoxicated should be severely punished and his license revoked.

The radical method of preventing the birth of criminals and insane already carried out in some of our communities, is, sterilization. Sentimental objections have been overcome by the invention of a simple and ingenious operation by which, without any mutilation or loss of structure whatever, any individual can be absolutely prevented from sending forth into this world some form of a vitiated offspring. The results of this operation have thus far exceeded all expectations. In case of the criminal its wholesome effect is noticed in the improve-

ment of his general condition and his mental poise, which enables him to obtain a healthy view of life. We may judge the improvement from the statistics on record. As a rule about 25 per cent. of criminals released from penal institutions return again, while out of 106 set at liberty after vasectomy only five have been sent back. From the point of sentimentality in these cases that require such radical treatment, there seems to be little or no objection, since out of 700 vasectomies performed fully three-fourth consented to the operation and upon many it was performed at their own request. Let us sterilize all our existing criminals, feeble minded persons, habitual drunkards and the incurably insane; and in a comparatively short time the output of the undesirable elements of our society will be materially reduced.

As the production of these unfortunates is not limited to any class of society, but are the results of the outcroppings of vicious and defective tendencies in all ranks and classes, including the highest, where the black sheep of a good family does not come merely by chance, the avoidance of injudicious matings utterly unfit for the propagation of healthy off-springs is imperative. A careful promotion by every possible means of fit and suitable matings will within a few generations, remove these defects in otherwise vigorous, desirable and successful stock.

To any man or woman, who finds himself or herself mated to an individual marked with any of the above enumerated defects, a divorce should be promptly granted, for to remain in wedlock with an individual afflicted with an incurable disease of the mind or body is a biological crime and against the best interests of society.

These are most effective and very simple remedies and not at all costly and if realized by our educators, social workers, physicians and legislators they would find a perplexing problem easily solved.

111 SECOND STREET.

THE BACKWARD CHILD VS. THE FEEBLE-MINDED CHILD.*

BY

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WHEN the problem of the exceptional child first presented itself to the consciousness of educators, it was natural that those children who deviated most pronouncedly from the average type attracted first attention. It was due to the pioneer work of such men as Dr. Edouard Séguin, a French physician, and others, that the possibility of training even the idiot within certain limits was first demonstrated. And that is not so very long ago. For many centuries, those unfortunates whose mental imbecility made them incapable of competing with their better endowed fellows had been the butts of vulgar ridicule and the victims of gross neglect. With the better understanding of their conditions and needs, persons of feeble mind began to receive the study and care which they required, not only on their own account, but for the sake of society for which their presence and abnormal activities were recognized to be often a distinct danger. The development of the social conscience made the responsibility of society toward its diseased, ineffective and abnormal members more and more felt and acknowledged.

There is no question that even to this day the problem of the care of the feeble-minded and abnormal members of society is only partially solved. The public is still but dimly aware of existing conditions and of the dangers they imply. We have no complete statistics of the number of feeble-minded persons in this country. We have at least approximate figures in the matter of feeble-minded children. Certain investigations point to the probability that at least 1 per cent. of all children of school age are distinctly feeble-minded. Adding to these the number of children otherwise abnormal, including imbecility and idiocy, moral imbecility and perversion, juvenile insanity and criminality, we may say that the total would reach perhaps 3 per cent. This would mean that of the entire child population of school age in the

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United States about 500,000 belong to this class. Of this number only a small percentage is as yet cared for in public and private institutions, which are often prevented from accepting more children by the fact that they are in part filled up with feeble-minded adults who have been there since childhood and for whom states and communities have made no provision. Many of those that are not provided for drift into reformatories, prisons and houses of prostitution.

Thus, the problem of the distinctly abnormal child is still grave and we may understand those persons who are particularly concerned in caring for the feeble-minded and abnormal, if they will again and again urge their claims upon the public.

But while it is perfectly evident that sufficient provisions must be made for these large numbers of truly abnormal children, as their presence in society constitutes a danger, it is obvious that it is even more important to save that far larger proportion of children who are merely *subnormal* or even *potentially normal* so that they suffering as they do from preventable handicap, may not slide downward in the scale of development, and that they may not become a fixed charge on the community. I am speaking of the millions of children who have not had their full chance and who are doomed to become misfits in society; who are considered backward; or who become truants, or are branded as bad boys and incorrigible girls; those whose development is retarded or fitful, who have difficulty in adjusting themselves to their environment, including their school environment; those who suffer from various physical difficulties, including nervous disorders in many cases. All these children represent really an actual positive asset in human society. But it must be clearly understood that this large class of children, if not saved for constructive activity within their social setting, is in danger of becoming a destructive force in society. We must avoid this vast human waste, just as modern processes of manufacture and industry are now saving what was formerly waste material and what is now often turned into products more valuable than the original object of production.

In pleading for a recognition of the needs of the feeble-minded and abnormal groups of children, their friends have sometimes made most extravagant statements. It was only recently said, in a public address, that most of the children in the public schools who are considered merely backward would, on close observation, be found to be feeble-minded; and it was further stated in another

address that it was very difficult to draw the line between backwardness and feeble-mindedness.

I deplore statements of this nature as they are extremely misleading. Without underrating the gravity of the problem of the feeble-minded, this class of children can be recognized with a fair degree of accuracy even now, and their problem is not now so much one of diagnosis as one of provision.

On the other hand, the number of backward children is large. Even if it were difficult to distinguish between backwardness and feeble-mindedness, immediate emphasis should be laid upon methods of differentiation. For society is most concerned in those children who are not segregated but who will remain part and parcel of our body social. To make them constructive forces, positive assets, useful and effective members of society, must be the main object of organized efforts in the province of education. All that society can do for the feeble-minded is to take care of them under custodial conditions, so that they may be out of harm's way and that those capable of such training may be developed sufficiently to reimburse society for the cost of their maintenance, wholly or in part.

The term "backward" on the other hand is a very ambiguous one. Your child may be backward in school for a great number of different reasons. Some of the most common of these are easily enumerated.

It is evident that in a country like ours where we have a great foreign influx every year, many children entering our public schools are handicapped not only by their lack of knowledge of the English language but also because the change of environment makes their adjustment to new conditions difficult. To transplant an Italian child from the narrow streets of Naples or Genoa into a metropolis like New York or Chicago, or into one of our rural communities, implies a bewildering complexity of new impressions which will require efforts of no little intensity on the part of the child to set himself right with his new conditions. In this struggle of readjustment, native abilities will remain obscured for a longer or shorter time.

The nomadic character of American life adds another feature to the problem of backwardness. There is little fixedness in our population and the continuous flux of Americans from country to city, from city to country, from east to west, and from north to south, gives to their children that instability of education caused by frequent change of schools which throws them out of gear in

their scholastic career only too often. Let us further not forget that temporary illness causes our children to lose time and connections in their school work. It has been shown that children suffering from bad teeth alone have lost about one half year in an eight-year school course, having become backward to that extent.

Speaking of physical handicap, we should mention that groups of children, by no means small, suffer from lameness, minor deformities and crippled conditions. It is only a matter of recent development that classes for crippled children have been added to some public school systems. Compulsory education laws, as a rule, make no provision at all for children of mental and physical defects so that children thus handicapped are easily lost in the race even though private agencies may sometimes provide for their care.

It is not commonly known how much of retardation is produced by slight defects of vision and hearing. Defective hearing is oftentimes a result of adenoid vegetations closing up the Eustachian tube. Since regular medical inspection has been introduced in school systems, a vast amount of defects of this nature has been discovered and often relieved. Many thousands of lame and crippled children have been given the chance of normal development on the mental side; and proper attention to their teeth, the fitting of glasses, the removal of adenoids, medical attention to diet, fresh air and clothing, to home and school hygiene; the introduction of school and district nurses and similar efforts have saved a great many children from falling behind in their school work and from dropping out of the race for useful citizenship. *Is it not absurd to class these many thousands of children in the feeble-minded group?*

There is another class of children who may be more truly called backward. I mean those whose mental development is slower than that of the average child. It is of course futile to expect all children to progress at the same rate. Such condition is just as impossible as to expect that the bodies of all children should grow equally fast and to equal proportions. Every mother knows that she may have to buy readymade clothes of the twelve-year-old size for her fourteen-year-old boy, or a fourteen-year-old size for her child of twelve. In a similar way minds grow at different rates. Some will grow faster than the average, and others more slowly. The slower child is not necessarily deficient,

or even lacking talent and power. Some of our best minds were slow growers in childhood.

Failure in school studies is also often due to mal-adjustment. By that I mean that it may not be the child's fault at all if he does not progress, if he loses interest and stamina; but the teacher's or the school's. Not every child can be forced into the same Procrustean bed of scholastic work. There are various types of mind, and the stronger and more active special mental tendencies are, the more apt are they to suffer from misunderstanding, repression, and misdirection. Here we have, among others, the problem of the truant who is oftentimes a boy whose nature rebels against the pedantic atmosphere of the school he attends, or one who reaches a period of his life when his nature demands special sympathy or special expansion, or who requires a different field and outlet of activity than is provided for him in the ordinary school which is fashioned for the average boy. Our methods and systems of education, especially of school education, are still much in need of development. They are yet built too slavishly upon tradition, and too little upon a true insight into child nature. The time is not yet here when we may truly say that the schools are for the children and not the children for the schools. We still have too many preconceived ideas of what children *ought* to be and *might* be to satisfy our prejudice or our vanity; and we care yet too little for what children really *are* or *can be*.

Children in our present conditions of civilized life, especially in the larger cities, have really great difficulty to assert their own rights and individuality. Our life conditions are so complex and so artificial, and they have grown to be so at such a rapid rate, that it is little wonder that the adjustment to these conditions is extremely difficult even to every one of us, and certainly to the child. To find his way and his place among these perplexing influences, circumstances and life problems; to find his groove and his vocation in this bewildering maze of transformative and complex tasks presents a problem to our growing child which is necessarily confusing. And our schools which endeavor to keep pace with these changing demands are losing their bearings in a measure and cram the child with a mass of undigested and undigestible details.

And in the place of actualities, of the real things which would mediate to the child distinct experiences, he is surrounded with substitutes. Pictures, books, mechanical toys bring even to the

nursery the semblance of life, whose reality the child does not touch; rubber tired vehicles, bicycles, street cars, elevated and subway trains, railroads, luxuriously fitted up steamships, automobiles, and in the near future perhaps aeroplanes remove the child more and more from the simple and direct experiments and experiences which his senses, his limbs, his body, his own mental struggle could give him. We protect and shelter him on all sides. We save him steps and failures and save him from bitterness. And the result is often that in place of a healthy, ambitious, stout-hearted child, we have a weakling or a crank or a neurasthenic. Many of these children will fall by the wayside in their school training.

Of course, there is also a true pathological retardation, and children of this type are in danger of degenerating into feeble-mindedness if not properly diagnosed and helped at the right time. However, even retarded brain development and a physiological retardation of the growth rate does not necessarily predestine the child to become abnormal. By the proper cooperation of the trained physician and the trained educator, many thousands of these children can be saved to useful citizenship. For there is a very plain distraction to be made between *retarded* and *arrested* development.

I will in passing say a word for the so-called bad boy. The bad boy is also a backward boy, not because he is not bright, but because he does not study. The bad boy and the truant boy are on the same level. The bad boy may be a misdirected boy. He may be one who through circumstances does not understand his environment and its forces and who has to become socialized and adjusted, who has to be made to see things rightly, and to feel himself to be a unit in a larger social organism. The bad boy may be a boy suffering from various physical defects. Interesting investigations have been made in connection with boys that have been referred to the juvenile courts. Instances are on record when children arrested for various kinds of misdemeanor and who had been frequent offenders ceased to be customers at the juvenile courts and probation offices after their intestinal irritation, or an aching tooth, or a tight prepuce had been removed. It is forcibly suggested that with every agency dealing with juvenile delinquents, a medical inspector should be coordinated. We shall find that in place of prisons and reformatories we should have a larger number of special educational institutions, and of sanitariums and hospitals for juvenile offen-

ders and for backward children in general, and that our system of education will have to be thoroughly revised so as to be better adapted to the genius of the child than it is at present.

One more condition may be mentioned. In a recent investigation into the causes of truancy, in Milwaukee, it was discovered that in fifty cases the children did not come to school for the reason that their parents were too poor to buy them decent clothing. In a great many states and communities where there compulsory education laws exist, parents may be excused from sending their children to school on account of their inability to clothe them properly. Nobody seems to be interested officially in what becomes of these neglected and unfortunate children until they are picked up, later on, from the streets by the police officers as juvenile offenders—unless private charity extends a helping hand. These facts open up the long chapter of social problems in regard to the saving of our precious child material which is going to waste right along through neglect, misery and poverty. It is natural that these children help swell the ranks of the backward and inefficient who are destined to become a burden to society.

Miss Jane Adams, in a recent article (*McClure's*, December), has forcibly shown the disastrous effect of "economic pressure." And at the annual meeting of the Children's Aid Society (New York) Secretary C. Loving Brace stated (November 28, 1911): "Poor and insufficient food, noise, confusion, excitement day and night, have favored the development, among the young, of St. Vitus Dance. Poor food, little sleep and long hours of confining labor are having the deleterious effect to be expected upon the older children." He also said that last year 8,125 homeless boys sought shelter in the society's working homes, which is the largest number in many years. His report showed that 655 orphans or deserted children gained through the society permanent homes and that the society has under its care 2,346 children in foster homes. Sixty-seven of these guardianless children were legally adopted this year.

These facts also open up the still longer chapter of the problem of social strata—human layers as it were, every one of which represents a different type of civilization, yea, even a different *stage* of civilization. Modern society is no longer made up of fairly homogeneous elements as in the past, but is rather a mixture of racial and evolutionary elements, the blending of which into one body, for active progress in culture, is a most

perplexing problem. This condition has been produced by the often overlooked fact that in every nation, since the time of the migration of people and even earlier, there have existed whole sections of the population, perhaps the conquered, or oppressed, aborigines, who, while they were dragged along through the ages, were hardly ever vitalized by the progress of civilization, but have remained stagnant and to this day represent instincts, impulses and ideals characteristic of bygone centuries. In a sense, these may be called our contemporary ancestors. In social and political upheavals, like revolutions and labor strikes, these uncivilized strata often get the upper hand. The problems of the North American Indian, the negro and other white men's burdens belong to the same category.

But all these matters can be but slightly touched in this brief statement. Other papers in this conference may discuss some of them more thoroughly and further discussion may be had at some future time. My own aim in this paper was to show that there is a vast difference between the relatively few cases of abnormal conditions and the far greater number of children who are handicapped in many other ways; that there is a difference between *arrested* development which can go no further, and *retarded* development which may produce power and genius; between backwardness and feeble-mindedness; between the bad boy and the criminal. Let us give to the feeble-minded and abnormal class the attention it needs. But let us emphasize that education is largely concerned in the saving of those who can be saved, in the uplifting of those who can be uplifted, in the progressive movement of civilization and culture which will carry the banner of humanity to loftier heights. A morbid interest in the abnormal must give place to a healthy interest in the constructive education of those who have sufficient normal stamina to be able to constitute a healthy social body.

PROGRESSIVE METHODS OF DEALING WITH JUVENILE
DELINQUENCY.*

BY

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NOT so very many years ago we thought so little about children that we believed there was not very much to know. We merely classed them crudely as good children or bad children, strong or weak children, bright or stupid children.

Little did we think then there were any other classifications to be made. But within the past ten years there has been brought about a great change in the care and study of children, and, of course, I can only speak from my observations and deductions as a judge of the Juvenile Court in Milwaukee.

Thousands of cases of all kinds are handled in a year and no definite set of rules can be laid down to be generally followed. Each case is separate and distinct and, therefore, must be studied and handled differently.

New light is being thrown upon the subject every day and a new word has come into the English language. The word is *Pediology*, and it is derived from the two Greek words meaning child and science, or the science of taking care of children.

The object is to study and to collate all kinds of information concerning the bodies and minds of children. Especially does it seek to know and understand all departures from normal standards, physical, mental, and moral.

It is to be feared that the educator's task is, indeed, a heavy one for the reason that the machinery of the public schools has become so complex, so intricate the problems of changing population, city congestion, sanitation and hygiene, which enter into and affect the child's daily life.

Pediology applies to children in exactly the same way as *mineralogy* does to ores, as *botany* does to plant life. From my own observations I believe that the outlook for the educators, and what is more important, the children themselves, is indeed a serious one, unless child science can speedily come to their rescue.

No less than ten years ago we were wont to regard children as

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merely undeveloped men and women. There were, perhaps, a few psychologists who knew that children had a status of their own, and it is entirely different from that of adults.

There has been brought about, since that time an extraordinary revival of interest in children, as is evident by the creation of a number of societies devoted to the study of boys and girls; the instituting of juvenile courts and the probation system.

There has also been brought forth a score of scientific journals and many academic chairs in universities resulting from this new interest in children and the sense of their increased value to society.

Certain weird tendencies in young children, which were heretofore looked upon as sustaining evidence of the doctrine of original sin, are now given over to serious study. There are tendencies among children to lie, to form gangs, to invent secret languages, create imaginary playmates, steal, and many other vagaries of youth, which have become of deep interest to students and educators.

There is a changed social attitude toward the children as a result of these studies, and, as someone has so cleverly expressed it, "the children have been taken out of the realm of poetry, into a field of scientifically organized care and protection."

I agree with Judge B. B. Lindsey, of the Juvenile Court of Denver, when he says: "I say unhesitatingly, nine-tenths of our girls go wrong because of the carelessness of parents; children read the daily papers, hear conversations not intended for them, and are exceedingly curious regarding matters of sex. I have no hesitation in saying boys discuss it in a most improper and unfortunate way. I have been amazed to find this condition exists in a much greater extent than I had ever dreamed.

"I have learned in the children's courts after repeated experiences in talking to little girls and their mothers in the privacy of my chambers, regarding their troubles brought to my attention by parents, officers and principals of schools, the sad part of the matter is the girl finds out too late what her parents might have taught and should have told her in time."

But there is not very much we can do to remedy these conditions for no law enforcement can cope with them, and only an education of the public will avail.

The children of to-day it must be remembered are the men and women of to-morrow, and therefore it is worth while that more than passing note should be taken of this large army all about us.

The first question to arise is, what has their schooling meant to them in the way of education and development?

Theoretically all children receive the same sound education in the public schools, but every teacher known how poorly facts agree with theory. Only about one-third of all the children who leave school at fourteen have received a grammar education.

Not more than one-half of the remaining two-thirds have advanced sufficiently to really graduate, so it comes about that a great majority of children leave school knowing little more than reading and writing although they have spent the required number of years in school.

Many of them are called "backward children," and it is claimed by school authorities that this number has become distressingly large. There is much perplexity and concern among educators over this strange backwardness of the great masses of children, and in most cases the parents can really be held responsible.

Medical examination of children in all parts of the country has revealed an immense proportion below the normal standard, and it is principally with these that juvenile court authorities have to deal.

A moral awakening is perhaps the greatest need of the average backward child, after his physical defects have been removed and his body given a decent chance to develop, for virtually all children are selfish, passionate, malicious, and very frequently thievish.

Children brought up amid environments wherein they live in a state of constant struggle—an unequal struggle in which their miserable little souls are daily and hourly crucified—are apt to be thievish and malicious. They love to destroy and they love to inflict pain. We find them every day in the juvenile court, while around them is a world of normal children who learn things easily beyond the power of the backward and vicious to acquire; the normal children praised, loved and rewarded.

The emotional nature of such children needs cultivation far more than their brains, for a backward child is like a rat and resents with uncomprehending bitterness being continually pushed aside and scolded.

There would be fewer defendants in juvenile court were there a system of psychological clinics and psychological hospitals in the public schools wherein that problem of retardation, with all its allied problems of feeble-mindedness, child delinquency, pauperism and crime could be solved.

Investigation has convinced me that a great deal of mental deficiency is caused by poverty, by overcrowded homes, poor food, bad air, and lack of playgrounds, and one of the first steps would be to take the child from home surroundings such as these.

The importance of child science with its relation to race improvement is apparent to all, and the only way to keep the children out of mischief and away from juvenile court in the first place is to provide them with proper environments. Sick or well, bright or stupid, genius or imbecile, every child ought to be brought to the attention of the public school.

The social question is perhaps one of the most important problems society has to deal with. We find in our work among the children many who are impure in thoughts and actions, and we asked the reason why so many children who have not reached the adolescent period are immoral.

If we look into the homes of many of these children, especially among the so-called lower classes, we find a family of six or eight living in two rooms, parents and children, and maybe a boarder or two. The boys and girls grow up without knowing the meaning of privacy or purity.

Not only is the home small but it is poorly ventilated and unsanitary, with no light or no air. And then the children are not given the proper food nor furnished with legitimate amusements. And both the girls and boys, as soon as the proper age limit is reached, go to work in shops and factories at very small wages.

These young working children have had no teaching at home, they have seen only the dark side of life. The mother, if intelligent enough, has not had time to instruct the girls properly. The father cares little for the children except as a means of revenue for the family. The girls meet all kinds of temptations in the workshop, on the streets, and even in their own homes.

Is it any wonder that they are finally gathered in by the police? But I do not mean to have it understood that I believe all immorality is confined to the lower classes of children. Quite to the contrary. There have been some very startling and almost unbelievable cases brought to my attention as presiding judge of both the juvenile and district courts of Milwaukee County.

Many young people of the higher classes are not taught at home the meaning of purity. Many times it is a selfish mother who is the cause of a daughter going wrong; and again it is just carelessness. A few of the cases are beyond all comprehension.

Yet such conditions exist, probably always have existed, and will continue to exist to poison the minds of the young and continue to bring into the world men and women of a crippled mentality.

What may be described as "the errors of youth" is a deplorable practice prevalent among children of all classes, and is by no means to be found among the offspring of the poor.

An alarming number of such cases have come under my observation, and to one who has much experience in juvenile work, a glance is sufficient to reveal the young person's secret habits, for his face and manner betray him in every way.

Not so very long ago the son of a wealthy manufacturer of this city was brought into court by the police, and the boy admitted having stolen a dozen or more automobiles.

His father owned two automobiles and the lad was well acquainted with their operation, but he seemed possessed with a mania for stealing other persons' cars, taking them for rides through the city, then far into the country and abandoning them.

When the parent learned of his son's arrest and of the boy's confession, he came to court, excited and vexed, claiming some great error must have been made, for he did not believe his son capable of such acts.

A long and earnest conversation with the lad in private brought a second confession from his lips, and my suspicion of his secret habits was confirmed. When I called in the parent and enlightened him, the man was shocked.

Then it suddenly burst upon the father that his son was no longer a child, but a young fellow of fifteen years of age, rapidly growing to manhood, who had for the past three years secretly visited upon himself the evil which was draining his physical and mental resources and reducing him to a state of imbecility, inflaming his brain with vicious thoughts and bringing about a state of incorrigibility the undoing of which promised to be a long and tedious effort and one fraught with heroic work.

Just the other day the probation officers brought in another little chap, scion of wealthy parents, and his confession involved a little fifteen-year-old girl, daughter of prominent people of the city.

It developed that during the absence of the boy's parents, and unknown to the servants, the boy had taken the girl to an upper bedroom of the house and kept her confined there for three days.

It was but another case of early degeneracy, and we found, as

in many other cases, that where there is one little girl gone wrong, six boys or more become involved.

True facts concerning the children were brought home to the parents forcibly, and at first they failed to comprehend. When it finally did dawn upon them that a great misfortune had been visiting their children daily without their knowledge, they recognized their own ignorance in not watching the young persons more closely and guiding them along the right paths, through that dangerous period when the boy or girl is just leaving the land of childhood and about to blossom forth into manhood and womanhood.

Too much is left to the teacher or the social worker, while the mother, through a false sense of modesty, hesitates to instruct her young daughter in things pertaining to her own health and welfare. The father is engrossed in business and does not realize that it is his duty to instruct his son in things he ought to know.

Yet this very argument that I am now making has been made time and time again by persons identified with juvenile work. If children of all classes could be kept from seeing things that are evil, hearing vile stories, reading impure books, much of this trouble might be avoided.

I believe these five-cent moving picture shows work an evil influence among the minds of the young, especially upon young girls. The cheap theater becomes a rendezvous for the young people, and there are times when the pictures exhibited are not good, wholesome and clean.

There is too much of the melodramatic in them, yet therein lies the fascination that solicits patronage, for without catering to the weak, vicious and transient, there would not be that appeal to the yellow streak in children—a yellow streak which makes them gloat over the fallen and disgraced and causes pictures of crime and bloodshed to hold them with consuming interest.

I have sat in cases at court where the mother has told me things right before the children that are shocking. When I reminded the mother that such talk ought not to be before girls and boys, she laughed and remarked that they were too young to understand.

But they were not too young, and listened to all that was said, and if they did not understand at that time, they would soon find a playmate ready to enlighten them.

The home should be the most sacred place on earth to the child, far ahead of the church or the school, and the teachings of the

home should mould the character. If there is a lack in this line the child is liable to go wrong after all the teachings of the school, church and social circles.

As I have already said, there can be no set of rules laid down and followed out to a successful conclusion. Different remedies must be found for every case. I recall one particular case of about six months ago.

There was a little chap whom we shall call Nick, brought before me in juvenile court and described "as the worst boy in town." To-day—well, it might not accurately be said he is the best boy in town but he is far from being the worst.

Nick's regeneration came about in a peculiar manner. When Nick was arraigned in court he was fifteen years old. He had spent his short life running wild in alleys and lived in one of the poorest districts of the city.

In support of the statement that he was the "worst boy" Nick was accused of being a practised thief, he smoked cigarettes, cursed astonishingly, threw stones at his mother, could not be believed, and——

Well, the list of Nick's shortcomings ran on almost indefinitely. The recital lasted twenty minutes, and was backed up by a statement of many instances in support and illustration of each charge in the indictment. The only evidence that any of them was exaggerated was the doubt thrown on the charge that Nick could not tell the truth.

This was when he cheerfully admitted the accuracy of all the accusations against him. Maybe this should stand in Nick's favor. Nick was after all not the worst boy in town. They who had brought Nick to court had a great deal to say about environment and other influence and things.

It might be nice to say that all of a sudden Nick, convinced of the error of his ways, became white as snow and sprouted wings. But it didn't happen in just that way. It was several days, in fact, before there was any noticeable improvement in the boy.

He was given to the same outbursts of temper. He had thrown stones through a few windows. He had cursed his mother and everyone else with great fluency and force. But to avoid any further recital that cannot be other than painful, it may be said that after Nick had been kept at the Detention Home for about a week it occurred to him that none of the other youngsters called him names.

Meanwhile we were seeking some interest to which Nick's

energies might be directed. Nick's parents were Greek, but Nick knew nothing at all of Greek history, and had no thought that Greeks had not always been identified with the shoe polishing industry and the marketing of bananas and oranges.

The art of the ancient Greeks was mentioned to the lad one day and he evinced some interest. He said he drew pictures himself. So he was given books on Greek history to read but he was even more interested in the pictures they contained. So he began making pictures of his own, less classic perhaps, but not without certain vigorous qualities.

To-day the boy's masterpiece is a caricature which points a moral in which Nick has become seriously interested. It shows the head of a callow youth of flashy dress, who is smoking a cigarette.

Nick, in an effort to show the dark rings of ill health that encircle the eyes of a youthful cigarette smoker, has blackened the eye of the youth in a way that leaves no doubt of the effect he sought to convey.

Thus we learn that art has influence other than for a narrow sort of culture, though it must be admitted that some artists smoke cigarettes. But maybe it wasn't so much the refining influence of *art* that brought about the regeneration of Nick, as it was the fact that in Nick's case art was an interest that engaged his attention to the exclusion of those untoward activities which had won Nick the title of "the worst boy in town."

A certain habit of disregarding the ownership of any item of property which was not his own, and which interested him, was one of the shortcomings which brought Nick to juvenile court. It was perhaps the worst and the most characteristic of his shortcomings.

But six months changed the boy greatly. He came a shifty eyed youth, snarling, shuffling, a sneak and a thief in appearance as in fact. To-day he is a straight, clean, steady eyed, respectful and likable. The boy's future will be determined by circumstances of his own tastes and efforts. That there will be a creditable future none of those who are now interested in him have any doubt.

But I am pleased to see that our public schools are progressing toward the standard of moral instruction, and nothing requisite in that direction will be wanting, I believe, when sex physiology is included in the curriculum, and children are given a thorough knowledge of the subject.

Every child is born with an innate curiosity which is enhanced by the prudery manifested whenever this subject of the origin of life is broached; in the study of biology this curiosity can be turned to good account by elevating the idea of the sex function in the mind of the child.

The sex question has taxed the wisdom of educators and all intelligent thinking people in all ages. Owing to the dissemination of more knowledge in these latter days, the solution has at last begun, and the direction of the wind was never better shown by the proverbial straw; and on the attitude of the people toward it, depends largely the length of time for its final solution.

It must be evident to every observing and right thinking person that the vicious effects from lack of knowledge on this subject permeates every class of society, and if not soon checked this moral pestilence which walketh in darkness will undermine the very foundation of the nation and destroy the race.

Since the evil is largely the result of ignorance, the best way to combat it is by imparting the correct scientific knowledge. Biology, the science of life, clothes all creative energy with beauty and majesty, and shows the wonderful provision nature has made for the preservation of the species. It proceeds from the one-celled plant life in the water, the reproduction of which is carried on by cell division through successive stages up to plants that have reproductive organs, continues through animal life from the ameba which reproduces by fission up to the animals whose eggs are fertilized in the body and hatched outside, to the more complex mammalia where the young are developed in the body of the female and whose highest type is man.

SYPHILIS AS A FACTOR IN THE ABNORMAL DEVELOPMENT OF CHILDREN.*

BY

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DURING the last decade only an extraordinary amount of attention has been paid to the mental development of children, their inclinations and their propensities. During the past centuries children have been merely thought to be a secondary con-

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sideration in family life, to whom a father did his duty, when he properly fed and clothed them and exerted his paternal authority when they misbehaved.

Now the age of the child has dawned. Children are not only considered to be an important entity in the family, but also in school, as the citizens and mothers of the future nation.

Children are not nowadays expected to adapt themselves to a general formula of teaching, but should, and I suppose all authorities in pedagogy are agreed here, receive their instructions in a way that appeals most to their individual perceptive faculties, thus bringing out sharply their individuality and peculiarity.

If this be true in normal children, allowing that such exist as a type, how much more ought we to follow the same or like methods in subnormal or abnormal children with a view of fitting them as well as we can for the struggles of life.

Environment, bad example, and neglect may be taken for the most important factors in leading a child astray, but these conditions can be improved and, though they may have to a great extent a determining influence on the child's future life, their effects may be overcome and effaced under proper management *sublata causa*.

Alcoholism and syphilis and probably tuberculosis are the most important among the causative elements of abnormal development, however, which are liable to be transmitted from parents to their offspring and it is syphilis which is to form the topic of my brief address to-day, in as much as it has a bearing on the physical and mental development of children.

Syphilis is a communicable disease that may be acquired by inheritance or direct contact. In the latter case there is always an initial lesion, the chancre or primary sore, followed by numerous secondary lesions, affecting principally the skin and mucous membranes, and by tertiary symptoms, involving the bones, viscera and the organs of the special senses. In hereditary syphilis there is an absence of the initial lesion and the disease shows itself in the secondary form from the beginning.

Syphilis in childhood may have its origin in an hereditary transmission from diseased parents, or it may be acquired as an ordinary infection through contagion.

Acquired syphilis is by no means an uncommon condition in children. It is the result of direct contagion and, in the large majority of cases, is contracted by acts of negligence on the part of the parents or the attendants rather than by the con-

sequence of criminal attempt. A direct infection may have taken place from a maternal syphilitic sore, during the passage of the infant through the parturient canal. Very often a nurse, by the act of nursing or by kissing, will communicate it from a primary and very infectious lesion on or around the nipple or from a syphilitic abrasion on the mucous membrane of the mouth. I will add that a nurse may also be infected from a nursling, the latter having such infectious lesions.

The most usual way of infection, however, is the communication of the disease from adults to children in the act of kissing. This form of extragenitally acquired syphilis is most prevalent in Russia, where it even has assumed an endemic character, owing to the close living together of the poorer population, their defective nutrition, their habit of kissing each other very frequently and the lack of any knowledge of hygiene on their part. Entire villages have been infected in this manner. Extragenitally acquired syphilis is also appropriately called the syphilis of the innocent. Those especially interested in this will find excellent information in a book written by Dr. Scheuer, entitled "Syphilis Insontium, or the Syphilis of the Innocent." No matter how or where the syphilitic contagion finds entrance into the child's body, a chancre or initial lesion will appear at the point of contact, followed in due time by the later manifestations of syphilis. In older children it may have been acquired by sexual contact, which, however, is a very rare occurrence. The symptoms of the now ensuing disease are the same as those in the adult, but seem to be milder than those of the hereditary type, as the naturally curative powers of children are considerable and they respond very readily to proper treatment.

In children, cases of acquired syphilis after the primary lesion has disappeared, are liable to be mistaken for the hereditary type. The histories obtained in such cases are generally very vague and unreliable.

The manifestations of inherited syphilis on the other hand may appear *in utero* during the gestation period or show themselves immediately or soon after birth, or less frequently at a remoter period of life, viz., from the third to the twenty-eighth year. If it appears later than the third year we call the condition retarded hereditary syphilis.

Retarded or late hereditary syphilis is that form of the disease which concerns us most, as its manifestations are those conditions most likely to interfere with educational efforts. For we under-

stand by it all organic affections of later childhood and adult life, due to syphilis of parental origin.

Since the late manifestations of the acquired type do not differ materially from those of the inherited type we may also include these. Gummata and connective-tissue proliferation play the most important part in all these changes. Gummata are quickly developing unstable syphilitic tumors that may occur in any tissue of the body. They break down if no treatment is instituted, thereby causing destruction the importance of which depends in turn on the importance of the organ or organs involved. Inflammatory connective tissue proliferations, though also occurring sometimes in the late type, are more frequent in the earlier manifestations. It is the dire result of these various processes that we are confronted with in school children.

Prof. Dr. Fournier of Paris, whose lectures at the l'Hopital St. Louis, I had the privilege to attend there years ago, has devoted much time and labor to the study of the ravages made by syphilis in the child, especially in the osseous system with special regard to the teeth, and it seems to me judicious to take the scheme he has laid down in his book "*Recherches et diagnostic del'heredo-syphilis tardive*" as a basis for our further considerations.

The habitus or general appearance is quite striking in some of these children. It would be surprising if a disease which causes so many fundamental changes in a child's body should not find an expression peculiar to itself in the general appearance of the sufferer.

There are certain conditions in the habitus and the countenance of the syphilitic child, which, although not pathognomonic, can serve us as corroborating evidence in the presence of lesions more definite in character.

Such children are usually delicate, sickly looking and ill nourished, with flabby muscles and a typical pallor with often a grayish tinge. Their apathic expression stands in striking contrast to that of scrofulous children, with their expression of precociousness. These latter have delicate, pale or pink cheeks, finely chiseled features, thin lips, fine lower jaws, bright eyes and long eye-lashes. The physical as well as the mental development of heredo-syphilitics of an outspoken type is retarded. This retardation may be of such a degree that it may end in infantilism, as they advance in age.

They begin to walk and talk late, cannot keep up with the

other children in mental work and cannot do simple tasks which others of the same age will perform without difficulty.

The signs of puberty appear late in both sexes. The menstrual function in girls and the development of the breasts are retarded together with all other phenomena, generally attending the changes at puberty.

Growth seems to be arrested and we not infrequently find children of fourteen looking as though they were six, and women of forty who look like children.

A precocious obesity, sufficiently accentuated to impress one as somewhat monstrous and devoid of gracefulness is also quoted as one of the exterior signs of Fournier. It may be general or confined to the lower part of the body, especially the abdomen.

Among the changes in the bones which are the results of syphilitic processes, on the one side due to a morbid and undue intensity of growth, on the other to retardation, and which beyond any doubt must exert deteriorating influences on the mental capacity of the child, those of the skull are probably the most striking ones. Bosses (bosselures, Ausbuchtungen) of the frontal, parietal and occipital bones are frequently seen.

Through overdevelopment of bony centers in the parietal bone and retardation of the development and the premature union of the intervening suture, the skull may assume the so-called natiform appearance. A jutting out of the bones of the forehead, converging to a more or less sharp ridge from above downward anteriorly, gives rise to a formation called boat-shaped forehead. It can easily be understood that where the bony structures do not expand in development or where the sutures close too early so as to make the skull rigid instead of retaining its usual expansibility, such can only take place at the expense of the more important softer structures, which they are designed to contain, namely, the brain. Hyprocephalus, due to fluid within the serous cavities may be due to hereditary syphilis and may lead to a condition simulating tuberculous meningitis. It should therefore always make us suspect a possible underlying syphilitic taint. A skull and face in which one side is markedly larger than the other is a condition also enumerated among the syphilitic stigmata. The face will sometimes offer irregularities which are considered to be quite characteristic.

First to be considered is the so-called saddle nose, which consists of a flattening of the upper part while the lower part remains

unchanged. This is a congenital effect, however, and is seen in very young children. The following two types which owe their existence to a breaking down of the bony structures that support the bridge are acquired later.

We have here either a flattening of the upper part of the nose with the lower part turned up or the same flattening which, however, is divided from the lower upturned part by a transverse sulcus—the so-called *nez-en-lorgnette*. The two latter forms are somewhat rare in children, being the consequence of a very destructive and malignant process.

The nostrils are often discharging an ichorous and foul-smelling pus, a condition which may be the forerunner of the destructive bone changes above described. A destructive process may extend through the floor of the nose to the palate, causing sharply defined and oval holes in the vault of this structure.

Deformities of the roof of the mouth concomitant with a faulty development of the cranial bones are common.

The mechanical effect on phonation due to such perforations and deformities can easily be appreciated. Fournier also mentions the so-called hare-lip as a consequence of this disease, likewise a flattening of the face from side to side and an insufficient development of the lower jaw, resulting in a retrocession of the same, thus bringing the upper one into strong prominence. The ears may also be abnormally thickened, irregularly formed or extremely small, or even monstrously deformed.

The so-called triad of Hutchinson will have to form our next topic for consideration. Opinions as to its value differ, but by most it is thought to be absolutely pathognomonic.

The chief features of this are signs of a former involvement of the ears, resulting in more or less deafness, the vestiges of former inflammations of the anterior membrane of the eyes, leaving more or less opaque spots, which interfere with vision in direct proportion to their opacity and extent; also the so-called teeth of Hutchinson, which are the two central permanent incisors that are pegtop-shaped, notched below and converge toward the median line. These three conditions combined have been and are yet looked upon as stigmata the presence of which leaves no doubt as to the syphilitic taint of the person on whom they are observed.

Other symptoms originating in the auditory apparatus seem to be of enough importance to enter into their discussion minutely.

Running of the ears may point to an active or chronic syphilitic process in the intracranial portions of these organs. Occa-

sional disturbances of hearing in a child, inflammations of the middle ear without any apparent cause, and perforation of the drum membrane probably point to a specific inheritance and should put us on our guard, so much more so, as a good deal can still be attained here by energetic antisyphilitic treatment.

A deafness developing all of a sudden, first in one ear, and then in the other, without any corresponding signs in the auditory apparatus, is one of the most deplorable phases of the affliction under consideration. It is central in origin, *i.e.*, due to a destruction in the nerve centers of hearing, and cannot be further influenced by any medication.

The history of such an occurrence, which is called *surdité foudroyante*, is conclusive evidence of a syphilitic taint. I fully agree with Fournier that all children with an antecedent syphilitic history in their families, that exhibit some, even the slightest stigmata, should be treated with antisyphilitics. Would not the prevention of only one case of the above-mentioned complications fully justify us in doing so?

The eyes, as I said before, are often involved. This involvement may range from the formations of opacities, interfering with vision, to destructive processes in their essential structures.

The opacity of the cornea as one of the most conspicuous affections forms part of Hutchinson's triad.

Squinting, stigmata of the iris, and in the fundus of the eyes, also malformations are mentioned by Fournier in this connection.

The significance of one malformation of the teeth has been pointed out by Hutchinson, but our knowledge on this subject has been greatly augmented by Fournier, who has studied their growth and development closely as far as they are influenced by syphilitic heredity. He recognized many dental abnormalities that serve us now as valuable guides.

The tendency of this disease to retard and distort growth and development is responsible for many faulty conditions in the dental system. The dentition is retarded, no teeth sometimes being found in children of three or four years. The permanent teeth, however, are the structures that have to bear the brunt of the malady. A variety of abnormal types are observed in these children. Teeth with eroded lower surfaces due to poor nutrition, such as are studded with innumerable minute cavities on their anterior surface, those of inconsistently small size or of a conspicuous inequality in size, as very small ones next to large ones, a cessation of growth altogether, so that a grown child

of fourteen has teeth that would seem to belong in the mouth of one of four years, abnormally wide spaces between the teeth, irregularity of implantation and many other defects which I cannot enumerate in the short time allowed for my paper, are met with. White horizontal streaks developing on the permanent teeth are thought to be very significant as corroborative evidence of this disease.

A close inspection of the integument will give us valuable data through the presence of brownish scars or active syphilitic lesions, commonly of the tertiary or gummatous type. Fine linear scars are very characteristic, radiating from the cheeks toward the angles of the mouth. The mucous membrane of the mouth and other body openings will often betray the condition by the presence of whitish glistening lines or spots which are the results of former inflammatory processes.

Arrest of development of the sexual organs especially in the male child is not uncommon.

The changes in the bone system may be manifold and there are some that are so characteristic that we can suspect from their mere presence a syphilitic diathesis. Thickening of the bone ends and joints, resulting in deformities due, as I brought out before, to excessive bone formation, also bony deposits on the shafts of the long bones, as a result of an inflammatory periosteal hyperactivity, loss of bone tissue from broken down gummata, and a slow indolent inflammation of the bones of the fingers, finding its expression in a painless swelling of the surrounding soft tissues and terminating in atrophic processes strongly point to the presence of hereditary syphilis.

A very characteristic deformity is the so-called "*tibia en lame de sabre*." Here the anterior aspect of the leg seems to be curved forward in its whole length, resembling the front of a curved sword.

Deformities of other parts of the body, as of the chest, the spine and the extremities are common. Pigeon chests and those of the sunken in type, beaded ribs and low legs may be found in hereditary syphilitics. As these are also evidences of rickets, I will not ascribe them to syphilis alone but will state that hereditary syphilis predisposes to rickets. Many joint affections as deforming arthritis and congenital dislocation of the hips are considered by Fournier as resulting from the same source.

Among the manifestations affecting the nervous system there are some of a greatly disturbing character, as intermittent head-

aches of sharp and torturing quality. (They are liable to be worse at night.) Convulsions as forerunners of meningeal involvement are often of important significance, especially if they occur in very nervous children that cry and tremble at the slightest provocation.

Nocturnal incontinence of urine is encountered frequently in this class of cases and is of significance, if it occurs in those that find it difficult to control micturition in daytime, in the absence of any inflammatory symptoms.

Disturbances in pronunciation and stuttering are often found in children of families of unquestionable syphilitic history.

Spasms of the facial muscles extending to the neck have been frequently observed by Fournier in children of this class.

I must not forget to mention general nervousness and epilepsy, which latter condition is too well known to necessitate an explanation, also hysteria and certain paralyses. The paralyses due to hereditary syphilis are as a rule of the flabby kind in the upper extremities, while those of the lower extremities are first of a spastic character and terminate in most cases in disfiguring contractures. General progressive paralysis may also be mentioned in this connection.

There seems to be no doubt from the foregoing that an impairment of the intellectual faculties of hereditary syphilitic children may be directly or indirectly due to their various disturbances, those of the skull forming the most important ones. Feeble-mindedness, imbecility, and the different types of idiocy, as microcephalic idiocy, and idiocy of the Mongolian type are striking examples of this class. It yet remains to be seen how much it influences the impairment of the moral sense. I feel that if we could cope successfully with the ravages caused by alcohol and syphilis, our prisons might be largely depopulated. Finally, unnatural overgrowth and many other but less important aberrations from the normal standard are said to be the remote effects of hereditary syphilis.

It would be impossible to go into minute details in the description of all these stigmata. The chief object of my paper is merely to familiarize you with the dreadful results of a disease which when imparted to a child, let us assume through negligence and ignorance, throws the little sufferer into life, partially or totally unfit to shift for himself.

By this hereditary taint a child is not only deprived of much of his power of resistance to disease but loses as well the normal

juvenile buoyancy of mind and finds it more difficult to cope with healthy children, who make him often a target for ridicule and rude jokes. The least the community owes to such diseased children is a course of instruction especially adapted to the receptivity of their minds.

In looking over this long list of results of a disease, the occurrence of which probably could have been prevented, or the further development of which might have been checked, if treated at the very first moment of its manifestation, we, as citizens as well as physicians, should feel ashamed that the possibility of such results still continues.

Should this not be an incentive to face so abominable a social evil with a view to its eradication and to work relentlessly for a change in those social conditions responsible for the transmission of this dreadful poison to innocent beings. I am fully aware of the difficulties we would experience in our endeavor to bring about changes that would be effective; I also hear my ideas derided as utopian, but in spite of all this I feel that we must venture out with them *pro bono publico*. For a start must be made. Why not now? There are three important points that have been suggested and, though we cannot expect of them to abolish all the evil, their establishment will surely prove to be material in bringing about decided changes for the better.

In the first place we should demand a control of the venereal diseases akin to that now exercised by our boards of health over tuberculous patients. Such supervision would at least prevent those infected from going about uncontrolled, and begetting progeny, for which it would really be better if it had never been borne.

Secondly, we should change our marriage laws in this respect, that a certificate of health should be required from those desiring to be united in wedlock. Such a certificate, to be issued by a physician of good standing well acquainted with all the manifestations of this disease, would at least tend to prevent a further addition to the great army of these miserable little creatures.

Thirdly, we should do away with false modesty, call things by their right name and instruct the masses on sex hygiene.

Let us show to the young people in public lectures the dangers which they are liable to incur, bring their attention to the beneficial influence of athletic sports in controlling sexual passion, and try to correct the misconceptions on this subject which are still prevalent among the masses. Such a process, which might

be called a crusade, would be bound to bring good results, which, if not sweeping in their effects, would certainly be instrumental in abolishing much misery.

158 EAST EIGHTY-FIRST STREET.

THE CONDITION OF NOSE, THROAT AND EAR AS A FACTOR IN EXCEPTIONAL DEVELOPMENT.*

BY

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THE importance of the Latin proverb, "*mens sana in corpore sano*"—a healthy mind in a healthy body—is fully recognized by the present generation. We are well aware of the fact that there is an organic substratum for every psychic manifestation. In our "*Century of the Child*" special stress is laid upon the early detection and correction of physical ailments, in order to avoid their deteriorating influence on the mental development of the growing individual. The exceptional mental development in children is due to a more or less marked functional disturbance of some important organs, especially of the perceptive ones. The outer world of physical processes is reflected into the inner world of the child's mind mostly by the eye and ear; a functional disturbance of either one will produce false mental impressions and in consequence, the psychic entity of the child will depart from the normal. A congenital or acquired defect of hearing will bring about more or less pronounced speech defects, which again will help to differentiate and separate the child from its "normal" play companions, and produce exceptional changes in its sensitive mind.

While the congenital disturbances of the organ of hearing (embryonic tissue in the middle ear, syphilitic changes of the inner ear and malformations of the external ear) are important factors of exceptional development, the acquired forms of ear diseases are of much more practical value, as their primary causes may be removed by proper medical treatment.

Among the causative factors are nasal obstruction, adenoids and tonsils, which by themselves give rise to definite somatic changes, with resulting exceptional development. As I have said elsewhere¹ "To understand the pathology of nasal obstruction in children, we must bear in mind that the nasal cavi-

* Read before the Second Annual Conference of the National Association for the Study and Education of Exceptional Children, N. Y., Dec. 2, 1911.

ties and nasopharynx in the growing child are very small and that they may easily become smaller or totally occluded by swelling of the adjacent spongy and lymphoid tissues, as occurs in the turbinates and in the so-called 'lymphatic ring' (adenoids, lymphatic cushion of the Eustachian tube, lingual and faucial tonsils). In addition to the above, the nasal passages may be partially or totally obstructed by congenital or acquired deformities of the osseo-cartilaginous framework of the nose.

"I would like to emphasize the importance of early recognition of congenital or acquired deviations of septum in children and their prompt operative correction, whenever they interfere with the normal function of nasal breathing. To delay such condition until the child grows older, predisposes it to the development or if already present to hypertrophy of the adenoids and all the accompanying ill effects."

When the air is inhaled through the nose it is warmed, moistened and purified prior to reaching the sensitive alveolar tissue of the lungs and the easily vulnerable Eustachian tube and middle ear. The mouth breather, indulging in a perverse habit, shows a characteristic facial expression, the mouth hangs partly open, there is a dull, heavy look about the eyes, an air of inattention to or lack of interest in its surroundings, and a general appearance of stupidity. The lack of proper ventilation of the lungs will soon be evidenced in symptoms of impaired nutrition. The mouth breather is frail and ill nourished in appearance, perhaps below the average height and weight; and the chest is thin and flat. A variety of symptoms arising from insufficient supply of air may be observed, such as headache, lassitude, inability to study or to do anything requiring mental concentration.

In reference to the aural symptoms of adenoids, the cases may be divided into three classes:² "The first includes those in the earlier stages of the adenoid growths, which have had occasional earaches and the occasional impairment of hearing apparently readily referable only to what is called a head cold. Children so affected have very variable hearing, are frequently accused of inattention and disobedience, and are either too young to know, or have too slightly noticeable an impairment of hearing to appreciate, that their derelictions are sins of the flesh and not of the spirit. In the second class are the more advanced cases, in which, the preliminary stages being passed, the impairment of hearing and the structural changes have become recognized as fixed facts, the impairment of hearing in some of these cases being

so great and so persistent that the child is regarded either as a deafmute or even as idiotic, the well known effect of obstruction of the hearing upon the mental development favoring the latter supposition. To the third class belong those cases in which suppurative otitis media is a result of the disease in the naso-pharynx, plus some local exciting cause, or is merely a coincident."

Enlarged tonsils will be a factor of exceptional development, when they interfere mechanically with the muscular movements of the soft palate, thus preventing the aeration of the middle ear, or when they are pathologically changed to such a degree as not to be any more protective but infective organs.

The impairment or loss of the sense of smell as a sequel to intranasal obstruction may sometimes be a factor in exceptional development, as some pleasant mental impressions (like the odor of roses) are excluded from the psychic entity of the child.

Children with nasal obstruction, adenoids and tonsils and slight impairment of hearing will show the mental symptoms of the "pseudoatypical child" as they only seemingly deviate from the average human type. Dr. Groszmann³ warns against a separation of medical and pedagogical treatment. We fully agree with his warnings: "Only too often a purely medical cure is considered sufficient. Take, for example, cases of adenoids. A very large number of children have been redeemed from apparent dullness and even viciousness by the resection of enlarged tonsils and adenoid growths. But apart from the possibility of recurrence, which is often due to the continuance of bodily conditions which favor the growth of adenoids, so that even after their removal a special regimen is indicated—there is also this other consideration. During the time of ill adjustment, when the afflicted child was fighting its battle with adverse circumstances, in school and at home, drifting into a state either of apathy or resentment, it developed mental habits of response which are clearly defective. These habits are not easily dropped. Even after the adenoid cloud has passed away such child may need very expert educational treatment for some time after its cure."

The organs of hearing consist of two portions, the sound conducting and the sound perceiving. The normal function of the former is interfered with, when the Eustachian tube does not provide the middle ear with the amount of air necessary to counterbalance the atmospheric pressure working upon the drum membrane, a condition which at the end will also disturb the function of the latter. The consequent chronic middle-ear

catarrh will irritate the child's mind by such subjective symptoms as head-noises, ringing in the ear, diplacousis, paracousis, etc., and will bring about a more or less pronounced impairment of hearing, especially for the lower musical sounds. These children when showing exceptional mental symptoms would have to be considered as "atypical children proper, being pathologically retarded in development. The children of this type may both mentally and physically, through neglect or adverse environmental influences, drop down in the scale of development into lower classes." Any neglected catarrh or suppurative process of the middle ear leads on to deterioration or even destruction of the inner ear, thus producing an impairment of perception or deafness for the high-pitched musical sounds. The apparently normal born child will thus be checked in its physical and mental development and will be finally dropped down in the scale to the sub-normal type.

Within the three semicircular canals of the inner ear is contained the so-called static apparatus, the normal function of which is essential for the maintenance of equilibrium. We must differentiate between manifest and latent disturbances of the static apparatus. In the former case, the child will feel dizzy, will tumble or fall and show spontaneous to and fro movements of the eyeballs, nystagmus, while in the latter case the impaired condition of the static apparatus can only be demonstrated by applying certain tests, of which we mention only the following:

When standing in Romberg position (feet close together, eyes closed), or when walking on a straight line, the child will tumble or fall and feel very dizzy. When being turned in a rotation chair for a certain number of times, the child will either show a much stronger nystagmus and of longer duration, or a weaker or shorter one, than a normal individual would, depending upon the irritability of the static apparatus, being below or above normal. On injecting hot water into the affected ear, the nystagmus is directed toward the same side, while upon injection of cold water it is directed toward the unaffected side, but always being in its strength and duration below or above the normal. Being in close anatomical relationship, both the acoustic and static apparatus will be mostly simultaneously involved.

Whether congenital or acquired, any marked disturbance of equilibrium will bring the child physically and in consequence mentally nearer to those predecessors of men in the chain of animal development, whose static apparatus was either defective

or missing. Thus the child would be of the "subnormal type, showing rudimentary atavistic development."

Through the courtesy of Dr. Groszmann, the writer examined most of the exceptional children at Herbart Hall. The following report, on account of insufficient observations and the novelty of the field of investigation, is a preliminary one. The details of the examination, including all the painstaking acoustic and static tests, together with a minute history of the respective cases, will be given later, the general conclusions, however, drawn from the above observations will be of interest.

The writer finds that nasal obstruction with or without adenoids and tonsils is present in both the advanced and backward type of the exceptional child. An impairment of hearing, due to defect of both the sound conducting and the sound perceiving apparatus, is usually present in the backward child exclusively. In the exceptionally bright child, on the other hand, there exists often a congenitally over-acute audition; the latter fact might help to explain the phenomenon of the musical prodigy (Wunderkind). The function of the static apparatus of the inner ear is markedly impaired in the backward child, while there exists an over-irritability of the same in the advanced type. While the congenital acoustic and static irregularities will have to be counterbalanced by individual scientific pedagogy, as advocated by Dr. Groszmann, the acquired forms will not yield to educational influences before their primary cause, nasal obstruction, adenoids, tonsils, catarrhal and suppurative conditions of the middle ear, has been removed by medical treatment.

In conclusion I might once more advocate the cooperation between pedagogist and physician, by quoting, with a change of the persons involved, the great German poet, Schiller:

Es soll der Lehrer mit dem Doktor geh'n

Sie beide wandeln auf der Menschheit Hoeh'n.

Physician and pedagogist should work together, as they both represent the highest ideals of humanity.

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2. Reik. Diseases of the Ear, Nose and Throat, D. Appleton Co., 1911.

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CLINICAL STUDIES OF EXCEPTIONAL CHILDREN.*

BY

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THE large cities of our country, composed as they are of all races and conditions, afford an unlimited opportunity for the study of the causes and manifestations of exceptional development. An institution so situated, founded solely for the study and treatment of this class of children, must of necessity attract to itself a great variety of clinical material. From the records of the Hospital-school for Backward Children, I have selected a number of case histories which I judge might be of interest.

CASE I.—J. H., referred by the Juvenile Court. First examined March 6, 1911; age, fifteen years. Father became addicted to the excessive use of alcohol several years before his death from tuberculosis, though at the time of and prior to the birth of this child his habits were excellent. He (the father) had never been able to learn to read although he had attended school and was a good workman, taking good care of his family until incapacitated by illness. Three older brothers of the patient, one of whom is a locomotive fireman, have never been able to learn to read in spite of every opportunity. The family history otherwise is negative. The birth conditions of the patient were normal. Nothing unusual was noticed in his early development except that he did not attempt to talk until the age of two years. He had whooping-cough at two years and a slight attack of measles at four. He entered school at the age of six years, but never progressed further than the first grade. Physically the boy is in good condition. He shows no major stigmata of degeneracy. He has an error of refraction which has been corrected by glasses. He responds well to all mental tests which do not require the ability to read, is self-reliant and resourceful, comes alone from his home about ten miles from the city, by train and then about five miles by street car, making all connections properly and buying his own tickets. His regard for the truth is, however, not of the greatest, nor can his obedience be depended upon. For this, faulty upbringing may, for the most part, be responsible. His recognition of figures and their combinations is good. He is able to name by sight nearly all of the letters of the alphabet, but, until after his admission to the training department a short time ago he could not read a single word.

*Read before the second Annual Conference of the National Association for the Study and Education of Exceptional Children, New York, Dec. 2, 1911.

This case is an example of congenital word-blindness, which subject I had the pleasure of discussing in a paper¹ read before this association last year.

Congenital word-blindness is a condition which interferes with the stamping of word images upon that particular portion of the brain which from inheritance through generations of reading and writing ancestors has become specifically developed for their reception; the angular gyrus either alone or in association with part of the supramarginal lobule.

The chief points of interest presented by this case are: the delay in the acquisition of speech, which shows a slight involvement of other speech centers, and the fact that four other members of his immediate family possess the same defect with apparently normal mental development in other directions.

The training received by this child is practically the same as that outlined in a paper read before the Pennsylvania Medical Society, as applied to a somewhat similar case. Miss Keyt, who is giving him her individual attention, states that in the short time he has been under her charge he has made very satisfactory progress.

CASE II.—R. D., age four years. Referred by the Fruit and Flower Mission. First examined June 22, 1911. Family history negative. Patient is the youngest of nine children. She was born at full term under normal conditions. Nothing unusual was noticed in her early history except that she never attempted to talk. The mother states that she has never been sick an hour. Physically she is well developed and healthy looking, giving no evidences of abnormality. Dr. J. H. McCready, to whom she was sent for further examination, reported that the nose and throat were normal, that there were no adenoids present, that while the tympanic membranes were slightly retracted, she responded well to the hearing tests. He was unable to make a satisfactory examination of the larynx, but to all indications it was in a normal condition. Her mental development in other directions is apparently that of any other child of the same age. Word-deafness may be eliminated by the fact that she has no difficulty in understanding what is said to her, even when she is unable to see the speaker. She makes known her wishes by gestures which are highly descriptive. The only word I have heard her attempt to say is, under stress of separation, "Mamma" which was made by approximating the lips for the labials and opening them for the vowels but with no attempt at breath utilization. She will be made to associate with other children as much as possible, in order that the desire for expression and imitation may be of some aid in the development of her speech.

Delay in the acquisition of speech is in individuals of subsequent normal development of only comparatively rare occurrence. Preyer(3) states that he himself did not learn to speak until toward the close of his third year.

CASE III.—H. S., aged six years. First examined February 11, 1910. Family history negative. Birth conditions were normal, and nothing unusual was noticed during infancy. Walked at sixteen and talked at eighteen months. When three years of age he fell out of the doorway of his house onto the stone sidewalk. No ill effects were noticed until about twelve hours later when he had a convulsion. Subsequently convulsions, epileptic in character, took place at intervals up to the time of examination. Grand mal attacks occurred at least several times a week, and sometimes oftener, while petit mal attacks occurred almost constantly. It was at last necessary to keep him in bed in order to save him from injury. Before his convulsions became so frequent he developed the habit of running away from home, and on one occasion was found in the police station. He would fly into a rage on slight provocation and showed great cruelty toward animals. He was subject to night terrors and to enuresis. He had been entered in the kindergarten but it was found impossible to do anything with him, on account of his great excitability and lack of attention.

Physical examination showed numerous minor stigmata of degeneracy. His face was badly scarred, the result of falls during convulsive attacks. His tonsils were exceptionally large and there was present a large mass of adenoid tissue in the nasopharynx. His mentality was that of the low grade imbecile of the excitable type. As the mother could not be persuaded to send him to an institution for the feeble minded, it was decided to attempt to ameliorate his condition. To make normal breathing possible Dr. J. H. McCready removed his tonsils and adenoids. The mother was instructed in regard to his hygienic regimen, and directed to report with him regularly for examination.

After the operation a marked improvement was at once apparent. Both the grand mal and petit mal attacks ceased, the child gained in the power of attention, his mentality improved, night terrors and enuresis ceased. At the beginning of the school year he was returned to the kindergarten, where his marked improvement since the previous year was noted. During the current year he has been going to school regularly, goes and comes alone and had been giving very little trouble, although the reports of his mother and teacher are somewhat at variance. On this account, he has within the last few days, been entered in the training department, so that he may be studied and the amount of improvement gauged.

This case is of interest for a number of reasons. The fact that he was somewhat late in beginning to acquire the faculty of

speech (eighteen months) and in attempting to walk (sixteen months), together with the physical stigmata, would give rise to a suspicion of primary hypoplasia. To this basis, in which would be included instability of the nervous system, we have added at the age of three a fall not sufficient to produce unconsciousness. In a short time convulsive attacks make their appearance, which gradually increased in severity, assuming the characteristics of grand and petit mal. With the removal of tonsils and adenoids the attacks suddenly ceased and in a period of twenty-two months have not returned. It is, of course, impossible to say that they will not return, if they were truly epileptic they probably will. It has been said that when a case of epilepsy is cured, it is proven not to have been epilepsy. My own opinion is that the child was born with an unstable nervous system, that his enlarged tonsils and adenoids, which were likely present from infancy, by their mechanical obstruction to breathing interfered with mental and physical development and further added to the instability. The head injury was simply an exciting factor in setting up the convulsion habit. The tonsillectomy and adenectomy removed an important source of reflex irritation, and improved the general health.

The boy is, in spite of his great improvement in mentality, apparently still an imbecile, though of higher grade than before. It is hoped that it will be possible to persuade his parents to send him to an institution.

CASE IV.—E. W., aged twelve. Referred by St. Elizabeth's Guild. First examined October 19, 1911. The family history is rather meager as the child is being cared for in a home and there is no one to give detailed information. However, from the Guild's nurse the following was obtained. The father and mother are deaf mutes; the mother since birth and the father since an attack of typhoid fever in early life. Both are somewhat irresponsible and improvident so that the family is in a very destitute condition. Two sisters of the mother are deaf-mutes. There are four other children. Two older than the patient have normal speech, a younger sister has a slight defect and a baby of eighteen months has not yet begun to talk. The patient did not attempt to talk until the age of two years.

Before her admission to the home she had never attended school for more than a few days. She is undersized and poorly nourished but rather intelligent in expression and actions. The hard palate is very highly arched, the teeth badly decayed and misplaced and the jaws malformed. Her articulation is very poor on account of these faults rather than because of any central

defect. While her mentality is evidently not of a very high grade, the deficiency is probably merely relative.

It is interesting to note in this family that, unless it should happen that the baby turns out to be a deaf-mute, not a single one of the children inherits the defect of the mother. The deaf-mutism of the father being acquired, of course, transmission would not be expected. In looking up the statistics upon the percentage of deaf mute offspring resulting from marriages of the deaf, I find that in 814 marriages, one partner congenitally deaf the other adventitiously deaf, 8.1 per cent. resulted in deaf offspring; 6.5 per cent. of the total number of children being born deaf. An attempt will be made to trace out the various other members of the mother's family, and the development of speech in the baby watched for carefully.

CASE IX.—C. S., aged nine years. First examined September 10, 1911. Father drank to excess and had syphilis, though it could not be learned whether this disease was contracted before or after the boy's birth. The mother has a large goiter, but no exophthalmos or marked nervous disturbance. The patient was born at full term under normal conditions. He was fairly healthy during infancy, but could not walk without assistance until he was twenty-two months old. He first attempted to talk at eighteen months, but his speech had remained almost intelligible up until the end of examination. He began school at seven years but never progressed further than the first grade.

In appearance the boy was healthy, intelligent and alert. Until he attempted to speak there was nothing to lead to suspicion of defect of any kind. On account of the father's condition a Wassermann reaction test was made by Dr. Denner which resulted negatively. The results of the mental tests at the first examination were disappointing and he was admitted to the training department for further examination.

Analysis of speech defect showed that his chief trouble was with consonant formation—Leonard, Yennard; mamma, nannie; wolf, dulf; little, yittle, etc. His speech was practically unintelligible unless one had become accustomed to his substitutions. Rock-a-bye baby, your cradle is green, he rendered, "Dock-a-dye day, er tadle i dien." The consonant "d" he substitutes for r, w, b, t, g, etc., while y is used constantly for l, n is used for m, and p is not sounded at all.

A very short time in the training department was sufficient to show that the apparent mental deficiency was only relative, due, for the most part to the speech defect. He is in reality a very bright active boy, who has never before had the opportunity to prove what he can do. He learns rapidly, has a retentive memory, has good motor control, and while still handicapped somewhat by his defect of speech is rapidly overcoming it. The

defective articulation is likely due to faulty glossokinesthetic word memories the result of primary partial word-deafness.

In this case a prognosis based upon the family and early history and upon the result of the first examination would have been one holding out very little promise.

CASE VI.—M. Mc., aged sixteen. Referred by Juvenile Court. First examined, January 15, 1910. Quoting from the letter of the probation officer in regard to the case. "John has been under our care for three years, having first come in on a larceny charge. In investigating his case, he seems to be made a tool of by the older boys and was very backward in school. I tried for two years to help the boy and would just about get him on his feet when some older boys would mislead him. Finally we had to send him to the Protectors, and he was only there a few weeks when the Superintendent notified us that the boy would have to be returned because he was so homesick, refusing either to eat or sleep and crying all the time."

When the boy presented himself for examination he complained of not feeling well, was briefly examined and as symptoms of a condition requiring surgical intervention were suspected to be present, he was directed to see Dr. Miller, who reported that he presented symptoms of chronic appendicitis, though not sufficiently severe to require operation. Though directed to return to the Hospital-school the boy failed to do so. September 20, 1910, I received the following letter from the probation officer, "I would like to ask you a special favor in regard to J. Mc. The boy has been released from jail to-day and is to be brought before the Court for trial on September 28. In the meantime I would like to have you continue his examination, so that I might use it as evidence to prevent the boy from being sent to a Reformatory, unless his physical condition would show that would be the best thing for him." It seems that in the time elapsing since the first examination, John had passed his seventeenth birthday and had also gotten into trouble, with two other boys, by holding up a woman and taking her purse from her. An opportunity for closer study was now afforded. Inquiry into the family history showed that at times the father drank to excess, though he was never improvident. He was a painter by trade and had suffered from chronic lead poisoning. One sister was temporarily insane, and one cousin committed suicide through alcoholic excesses. One brother had tuberculosis. The family history on the mother's side was negative except that one cousin died of tuberculosis.

The patient was very delicate as a baby and was born in a state of asphyxia. He did not attempt to walk until fourteen months and to talk until two and one-half years. His progress in talking was very slow. He entered school at eight years and never progressed beyond the third grade.

Physical examination showed him to have the development of a boy of twelve. From a radiograph of the wrist it was found

that he had the osseous development corresponding to Group L of Rotch's classification. By the Binet tests his mental development was placed as that of a child of ten years, although at tests of accomplishment he did somewhat better. As the boy's temperature was above normal he was sent to St. Francis Hospital for further observation in Dr. Cohoe's service, who after a period of two weeks reported that the patient was suffering from chronic nephritis.

When John's case came up for trial, the report was made that he had been found upon examination to be feeble-minded and to be suffering from disease of the kidneys, and he was committed to an institution for the feeble-minded accompanied by a statement of his condition with recommendations for treatment.

These cases have been chosen for illustration, not because of any unusual features that they may present, but to attempt to show that the exceptional child requires most careful and thorough study. An opinion based on superficial examination without taking into account the heredity, environment and individual characteristics is valueless, except in the most obvious cases of mental deficiency.

I have likewise attempted to demonstrate that it is not judicious in forming a diagnosis or prognosis to lay too much stress upon bad heredity or upon evidences of deviate development in early life. The most trustworthy proof of a child's mental capacity is his ability to develop to the full his special faculties under favorable opportunities. To determine this prolonged observation and intimate association is necessary. For this reason there should be in connection with every clinic for the examination of exceptional children, an observation or training department, where the child may be carefully studied.

CASE III is reported because of the unusually gratifying results following a comparatively simple surgical operation.

CASE VI is reported because our reformatories and jails all contain a large number of the same type, which should more properly be in institutions for the feeble-minded.

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SPEECH DEFECTS IN CHILDREN.*

BY

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HAVE WE A PROBLEM IN THE SPEECH DEFECTIVE?

THE problem of the speech defective is one which has a rather peculiar interest and importance. Its interests lie in the fact that it presents to the student of psychology a host of problems that bear on many vital issues in his domain, giving him also under laboratory control conditions, first-hand data, concerning those issues. The importance of the question can be viewed from two aspects. It is in the first place a problem of general educational efficiency. I have heard it said by an educational authority within recent weeks that as a matter of course we must let the defective alone until we shall have more thoroughly addressed ourselves to the general problem of the education of the normal child, and in a measure at least met some of the more pressing needs in that field.

The trouble with that conclusion is it is based on the assumption that in the case of the defective child you are looking out for his interests alone, and that since he is in the minority he must be neglected first. That, as I need not say in this presence, is a wholly erroneous view. As a matter of truth the law of the social order, that the problem of the rich is the problem of the poor, holds here. The problem of the defective cannot be isolated with impunity from the problem of the normal.

Everyone who has been a teacher knows that the bright, interested and capable child is not the one who constitutes the burden of the school-room. It is the laggard, the inefficient, the subnormal, the defective that weighs most heavily on the nerves of the teacher and pupils as well.

If I understand the great movement for efficiency in commercial lines, as Dr. Taylor and others have conceived it, the first point of attack is the sources of lost energy, misplaced effort and neglected forces. In other words, the whole efficiency movement begins with the stoppage of leaks, lost motions and costly frictions.

* Read before the Second Annual Conference of the National Association for the Study and Education of Exceptional Children, New York, December 2, 1911.

We have heard the complaint from educators that general psychology has been rather disappointing in its contributions to the practical concerns of education. It seems to me that I can see in the rapid growth of interest in the clinical study of the child a new point of contact which bespeaks a better situation in the future both for general psychology and for education. I do not believe that anyone, especially in America, is going to be scared by the warning given by Wundt that even an astute scientist like Neumann will turn to be second rate if he leaves the realm of pure science and becomes interested in matters of practical concern. This attitude of aloofness on the part of pure science or science for its own sake rather than the sake of humanity is of course somewhat responsible for the justice of the charges which I have mentioned above. But I also believe we have not proceeded in educational matters along the lines upon which the commercial world is now introducing science into its methods.

If you should stand before a class in which there was a stuttering boy trying to recite and watch this stumbling, halting, blushing and writhing embodiment of mental torture, and see the sympathy, worry, distraction of attention, and anxiety of the teacher, no less than of the rest of the class, you could understand what I mean by this great leakage of energy.

May I say that *no such child should ever be allowed in any school-room except one in which there is a teacher specifically trained to care for his particular kind of defect.* This I could say for the mere reason alone of general educational efficiency, and this, as I shall attempt to show later, is not the most important reason. To ask how such school-rooms and such teachers are to be obtained is to open up a problem of great magnitude which I shall not attempt to discuss here.

As a problem in the conservation of human life, the field of speech defects presents an interest no less urgent and important. Last year I obtained from the superintendent of schools of the city of Worcester, his permission to study some cases of stuttering in the public schools of that city. Ninety-three such pupils were found, some scarcely able to recite at all. I was told they frequently answered that they "did not know" when they really did know, rather than attempt to talk. Others stopped school because of inability to recite. They were all inclined to separate themselves from the rest of humanity and bear their inflictions in silence, in as much as there is no certain relief. Not one of these has had a fair chance in school. Makuen aptly quotes from

Tupper who says: "Come and I will show you an affliction unnumbered among the world's sorrows."

Dr. Edward Couradi in 1904, by a study of 87,440 school children, found 2.46 per cent. afflicted with speech defects. This rate applied to our school population gives a total of 430,000 speech defectives among the school children of America. Add to this the percentage found among the adults and we get a grand total of approximately a half million speech defective people in the United States. The number comprised in this class is greater by nearly three to one than that of the deaf-mutes, the blind and the insane, added together. These figures are based on the conclusions of Dr. Lenox Brown and Mr. Robert M. Zug.

What about the prognosis in this class as contrasted with that of other classes of defectives and atypical classes?

It would, of course, be useless to mention the deaf-mute, the deaf, the blind, and the like as having any favorable prognosis at all. In regard to the mentally defective I shall take time to quote the opinion of Dr. Barr.* He says "The mistaken idea of seeking a cure for mental defect doubtless has its root in a misapprehension of terms and in confounding idiocy with insanity. In the latter there may be found cure as for any other disease; but idiocy is not a disease, it is a defect, and one might as reasonably talk of restoring limbs to one born without them as of curing a defective brain. To replace what has never been placed is impossible. No, there is no cure, nevertheless, much may be accomplished in the way of amelioration and improvement. In the awaking of dormant faculties, and in the development and fostering of latent powers, deterioration may be arrested and retrogression prevented."

To quote from Tredgold,† "No case of real amentia (with the exception of cretinism) ever becomes cured. However mild it may be some defect will always remain, and this will render competition on an equal footing with the normal population impossible."

In spite of the hopes held out long ago by Dr. Seguin, and in spite of exceptional cases, I believe the above opinions would be accepted without question by most conservative workers in this field. I do not mean to question, however, the claim that the results which do accrue from work on behalf of these classes is

* Barr, "Mental Defectives," p. 130.

† Barr, "Mental Deficiency," p. 328.

worth all the effort and means expended on them and even more, but merely desire to point out this great neglected class of speech defectives in regard to the question of prognosis, and this I shall proceed to do, using the figures found by Dr. Couradi.* From 1827 to 1840 Colombat had 428 patients of whom he cured 52 per cent., improved 21 per cent., and dismissed as failures 27 per cent. Blume cured 70 per cent. of his cases. Coën gave his results in 1886 in the following percentages: 60 per cent. cured, 30 per cent. improved, 10 per cent. failures. Berkhan had ninety-six patients from 1883 to 1885. He cured sixty-five, thirty were improved, and one dismissed as a failure. There were twenty-five relapses. We learn from Gutzmann the results of public courses in forty-six German cities, in which 1,390 stutterers were treated. Of these 72.7 per cent. were cured; 23.6 per cent. improved, and 3.7 per cent. were failures. Dr. Gutzmann cured 87 per cent. of the 1,000 cases which attended his polyclinic in Berlin, 10 per cent. were improved and 3 per cent. were failures, 5 per cent. relapses. Of 600 patients attending the private instruction of Dr. H. Gutzmann 89 per cent. were cured, 9 per cent. improved, and 2 per cent. were failures. Oltuszewski cured eighty-seven out of ninety-five patients, and improved eight. These he thinks he could have cured had they repeated the course. Dr. Coën's public courses in Vienna for the ten years preceding 1901 show that out of 158 cases 60 per cent. were cured, 30 per cent. improved and 10 per cent. were failures. The failures he ascribes to laziness and irregularity. Chervin says that success is always certain if proper conditions are fulfilled. It must be remembered that these courses last only about six weeks, scarcely ever as long as three months.

I am unable to give you any statistical report of the success of the various treatments offered in America, but enough has been given to show you the bright picture of the prognosis in this class of defectives, and that is the point which I desire to make.

This splendid prognosis, it seems to me, is ample warrant for the isolation and special treatment of these defectives, but there is an even weightier reason, a reason which brings me back to the contention made at the outset—namely, that we are dealing here with a problem affecting the normal child no less than the exceptional. It is a well-known fact that one of the most fruitful causes of stuttering is imitation. A large per cent. of the cases which are attributed to heredity may just as correctly be as-

*Ped. Sem. xi, pp. 327-380.

signed to imitation. One child in a school room, then, becomes a menace to the health, success and happiness of all the rest. This is of course not true of any of the other classes of defectives to which I have referred.

I should like to give you somewhat in detail the work which has been done in the various countries of Europe, especially since 1886 when the German government, through the influence of von Gossler, then Minister of Education, took the matter up at State expense. Suffice it to say that from the various cities and countries of Europe more than a thousand teachers have been sent to the University of Berlin to receive training under Drs. A. and H. Gutzmann at public expense, so that practically every city and state of any importance in Europe has its special public courses. I do not fail to give credit for the work done by Colombat, Itard, Chervin, and others in France, but Germany must be credited with having first taken the matter up seriously and scientifically, and given it something of the dignity and importance which it deserves.

Even Japan has begun to take action in this matter. Mr. Isawa has taken up a statistical study of the prevalence of the trouble among Japanese pupils and has established an institution in which he has successfully treated several thousand cases by a method based on that of Dr. Alexander M. Bell, of this country.

I am aware of the work of a high order that is being done in a private way by Dr. Hudson-Makuen and others, but so far as my information goes, with the exception of some classes maintained in one of the public schools in the city of New York, we are alone among the civilized races of the world in leaving this vast field to the tender mercies of the quack, the charlatan, and the unscientific man with a "method."

For the benefit of the blind, the deaf, the feeble-minded, there are numerous state institutions, teachers, and benefactions, as well as private schools, teachers and donations for same, and while even these numerous endowments amounting to millions of dollars may be inadequate to meet the needs of these great fields, it is an odd sense of justice that nothing should be spent for the amelioration of the condition of the speech defectives. My faith is that it will not always continue thus.

WHAT IS THE NATURE OF THE PROBLEM?

It must be stated at the outset that my own study is of the nature of an experimental attack on the subject of what I have

arbitrarily chosen to term functional speech defects through the means afforded by laboratory psychology. There have been many theoretic studies of this abnormality, so that the literature of the subject has grown to considerable proportion. Dr. Edward Couradi made a résumé of this literature up to 1904.

It has only been within recent years, however, that any experimental work has been done in this field. Gradually, within that time, it seems to me, the burden of the task of handling the problem has been shifting slowly from the physician to the psychologist. Formerly it was thought to be solely with the physician. Dr. G. Hudson-Makuen (*Med. Rec.*, vol. lxxvi, p. 1015) states ("A Brief History of the Treatment of Stammering with Some Suggestions as to Modern Methods") that Galen, Celsus, Klencke, Dieffenbach, Detmold, Wolf and others regarded the whole difficulty as lying in the tongue, and employed treatments accordingly. He speaks of the many mechanical apparatuses that have been employed to hold the tongue in proper position, such as the famous pebble of Demosthenes. Surgical operations of various sorts, such as the severing of the hypoglossal nerve, the lingual frenum, and various extrinsic and intrinsic tongue muscles. Dieffenbach took out a wedge-shaped portion from the tongue; Galen cauterized it; Detmold pierced it with needles; Kustner used embrocations, cauteries and blisters; Yearsley and Braid cut out the tonsils and the uvula. Another remedy was to put a cork between the teeth, another was to press the thumb against the chin, and another was to lift the tongue to the palate. Other methods are mentioned by A. Gregoire (*Les Vices de la Parole*, p. 74), one of which was smoking a pipe, on the ground that the nicotine was a sedative to the vocal cords. Gerdts* of Germany gave a tincture consisting of rectified alcohol, peppermint oil and chloroform in the endeavor to still the cramps of the diaphragm. Schmalz suggested an embrocation of petroleum on the throat. Langenbeck experimented with inoculations of croton oil. He speaks of a Frenchman, Serres, who would seize the arm of the stutterer and move it briskly up and down, first at the beginning of each syllable and then at the beginning of each phrase.

All of these methods of treatment Dr. Hudson-Makuen correctly insists are wide of the mark since stuttering is not a peripheral but a central disturbance. He also, as I think, correctly insists on the knowledge of the psychology and physiology of speech as a necessary prerequisite for the proper handling of speech

*Appelt.—Stammering and its permanent cure, page 38.

disturbances. This knowledge is unfortunately not general but on the contrary, as he claims, "quackery reigns supreme in the treatment of stammering."

Gregoire says that as far back as 1875 the French academician Moutard-Martin said that stutterers are not "treated," they are "educated." More and more evidence seems to be coming from all sources for the warrant of the taking up of this problem by the psychologist not only because of the fact that he must be looked to as the one to solve it, but because of the unique psychological interest which is attracted to it. I trust that the total result of the present study will point toward that conclusion. It seems to me that if there be adequate reasons for the abandonment of the use of bromides and other medical treatments for psychoanalysis and more educational methods in certain cases of hysteria, and if the same plan is used even in organic speech disturbances like aphasia, it does seem that to use educational methods in the case of these purely functional speech disturbances has an a fortiori warrant. Some preliminary reasons for this conclusion may here be mentioned. Dr. Hudson-Makuen (*Pa. Med. Jour.*, Dec., 1909) takes the position that all the good which has accrued from the old crude methods of surgery and the like has been due to their psychic effect. In this, of course, he means to conclude that the cause of the trouble is psychic rather than physical. Indeed, he says that "many people stammer under certain conditions, largely because they think they will. All their past experiences with speech have combined to confirm them in the thought and it soon becomes a sort of 'fixed idea.'" He makes extensive use of the analogy of the person who has a good musical instrument but is unable to play it. This, he says, is the situation of the stutterer. His speech apparatus is perfect but he is unable to use it. I draw from that a conclusion which I am not sure would meet the endorsement of Dr. Hudson-Makuen—namely, that if it would be absurd to appeal to medical interference in the case of inability to play the piano, it is no less so to do the same thing in the case of inability to speak.

Dr. Elmer L. Kenyon, of Chicago, also writing in *Pa. Med. Jour.*, Dec., 1909, claims that the problem is essentially a medical one, and yet in the same discussion he says that it should be considered a matter of child development, and also that it is a disorder which concerns the development of that mysterious elusive but important thing called the subconscious personality. Furthermore he says that the public schools having already taken up

the deaf, the blind and the feeble-minded, have now only to enlarge their scope a trifle and take children having defects of speech whose cure depends upon a certain training which in a measure is allied in character to the regular work of the school.

Dr. D. Braden Kyle of Philadelphia makes a similar inharmonizable discussion of the same topic. After complimenting Dr. Hudson-Makuen for having been a pioneer in taking this matter out of the hands of nonmedical men he goes on to say that "the mechanical part, however, would not be the entire cause of the defective speech; it is merely an associated condition." The habit is certainly a mental one. Another case of the same kind of contradictory treatment is found in a statement by Dr. H. G. Langwill, physician to Leith Hospital ("A Plea for the Scientific Treatment of Stammering," *Rec. of Neurology and Psychiatry*, vol. v, p. 259) who makes a plea for the scientific treatment of stammering by the general practitioner, saying that it is undoubtedly a neurosis. He goes on, however, to admit that the nervousness so often taken for a cause is really a result. In his definition he makes even more clear this attitude. He says: "Stammering is essentially a functional affection—a neurosis, the result of defective working of the complex coordinated mechanism concerned in the production of speech, and not a defect of structure. Pathological lesions, therefore, connected with it cannot be looked for, and herein lies one of the great inducements to the adoption of proper scientific treatment of the condition. The difficulty of enunciation will be found to be essentially due to a want of the necessary harmony between the functions of vocalization and articulation."

Another fact of great weight which bears directly upon this issue regarding the nature of stuttering is that it is recognized by all authorities without exception, so far as I know, to be contagious. The statement of this fact is well made by Dr. Hudson-Makuen. He says that "children are not born stammerers but they are born with a highly developed imitative faculty."

I am aware that there are many who are not willing to accept the conclusion which seems to me to be legitimate. Dr. H. Gutzmann, for instance, whom we must give first rank in effective and scientific work along this line says that all stutterers without exception are neuropathically afflicted persons, in whom general nervous disturbances are to be observed. He is, however, ably opposed in this view by Dr. Otto Laubi who takes the position that the neuropathic symptoms always found by Gutzmann are

secondary or sequential. The primary cause to him is psychic. This psychic cause to him makes all the rest fade into insignificance. He thinks that each man carries about with him both conscious and unconscious emotional tones. Dr. Netkatschew has recently written a brochure on the psychic aspect of the question in which he claims to clearing the way to a new psychological treatment of stuttering which he thinks is caused by a feeling of anxiety which arose perhaps unconsciously in childhood. My own observations convince me there is an affective element in the acquisition and in the functioning of speech in the case of the child which it is difficult to evaluate from the adult point of view. Hence, I can in some measure appreciate the stress which Wundt has put upon that subject in relation to the growth of language. But that need not be elaborated here.

Dr. Scripture says that stuttering is a distinct form of nervous disease and that it can only be treated legitimately from the medical point of view. However, in a reprint sent me by Dr. Scripture I find these words: "Stuttering is essentially a mental trouble—a psychoneurosis—arising from a compulsive idea."

I quote again from Dr. E. B. McCready: "I have," he says, "elsewhere defined stuttering as a condition in which through lack of coordination of the nervous mechanism controlling the organs of speech, which may include either excessive or deficient innervation, there is a difficulty in enunciation which may comprise either spasmodic effort without articulate sound before the utterance of the one following. With it may be associated compensatory spasms of muscles not directly involved in speech. While this definition, an adaptation of those of others, seemed satisfactory to me at the time, I have since come to realize that like those of others it is simply an enumeration of symptoms. To my mind there has never been a satisfactory explanation of the cause of stuttering. To treat it as a neurosis, a mental tic, is not going far enough. A neurosis it undoubtedly is, after the establishment of the compulsive idea, but calling it such does not explain why certain individuals under the influence of fright, irritation, acute disease or nasopharyngeal irritation, begin to stutter while others equally neurotic and exposed to the same influence do not."

In spite of this strong presentation we find Dr. McCready leading us into hopelessly tangled woods instead of clear ground. For instance, he is endeavoring in this very paper to classify stuttering with amusia, saying that he has put it "among the

group of developmental defects caused by biologic variations in centers and commissures through which are derived perceptions of music and rhythm." In this he anticipates, but to my mind fails to answer the objection that stutterers are almost all able to sing. He also to my mind fails duly to credit cogency of the bearing of the case which he himself quotes, namely, that of an aphasic mentioned by Dr. F. X. Dercum, who could only say two words "yes" and "no." This same aphasic, however, could sing Auld Lang Syne, both carrying the tune through and also enunciating each word clearly. This gives conclusive proof of what has really already been recognized (Jastrow, Baldwin et al)—namely, that the center of musical control is not the same as the center of speech control. He thinks that Dr. Dercum is correct in saying that "reinforcement" can explain the apparent inconsistency of his position. One can hardly see how the musical center can reinforce a speech center which has been destroyed by local lesion as in aphasia. It would seem better to use the term "vicarious function" which is now being spoken of by von Monakow as a handy dodge for all unexplained localization theories. In any event it seems utterly beyond me to conceive how a "biologic variation," which he says is the cause of the lack of expression and appreciation of melody and harmony can sometimes be present and sometimes be absent in the same individual and moreover can find its origin in all sorts of psychic experiences as grief, shock, fear, anger, and the like, as well as by imitation, all of which things we know to take place with the stutterer.

Stekel says, in his "*Nervöse Augstzustände und ihre Behandlung*": "One of the darkest forms of hysteria is stuttering, the anxiety before speech. I have studied this neurosis in many cases and have always come to the same result, that stuttering is a psychic treachery (*Verrat*), just as in misreading or miswriting; an unconscious complex crowds itself between the syllables and the words. There are inner contradictions which hinder the free flow of speech, not faulty articulation, faulty breathing or unclear vocalization."

The physicians have been the first to address themselves to the solution of this problem, but by weight of the verdict of their own findings the psychological end of it is assuming larger and larger proportions, to the extent that some at least are ready to say that it is the whole of it. If the physician with his legitimate bias for the medical point of view has seen so much that is of

psychological interest in this question it would seem that the time has come for some sort of systematic approach to it along that line. These attempts by physicians, while they have always been sincere, and moreover have been the only attempts that could lay any claim to being scientific, have been and still are altogether too sporadic to offer the slightest hope that this big issue will find a solution at their hands.

The seat of this disturbance in the opinion of those who have made it a study has shifted from the peripheral to the central organs by slow and yet certain movements. Merkel in 1866 placed the cause in the will, as Deleau had done as early as 1829. Many if not indeed most writers of modern times have concluded that stuttering is a psychic ailment. Among these are mentioned Barth, Troemer, Stebel, and Appelt who has recently written a book on the subject of the treatment of stuttering by the methods of psychoanalysis. The list could be extended.

In a letter to me Dr. Morton Prince recently said: "I am entirely in accord with you in your point of view regarding the pathology of stuttering. My observations have led me to think that the mechanism is psychological rather than physiological."

And now in conclusion: If this class of exceptional children is not characterized by any mental deficiency, if there are no pathological lesions to be found, and no anatomical abnormalities, the answer to my second query becomes at once obvious.

SOME OBSERVATIONS ON THE VALUE OF PHYSICAL ACTIVITIES IN THE TREATMENT OF ATYPICAL BOYS.*

BY

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My interest in the educational problem of atypical children was aroused by some personal experiences with boys who manifested various deviations from the normal.

Under our present social and economic conditions, there are many homes with intelligent and well-to-do or wealthy parents where the environment is distinctly unfavorable to the normal physical and social development of children.

* Read before the Second Annual Conference of the National Association for the Study and Education of Exceptional Children, New York, December 2, 1911.

The manifold activities which were carried on in the homes of our grandfathers afforded valuable physical, mental and moral training to the children of those days. These opportunities are gone never to return. The school is expected to furnish all the educational opportunities which were at one time provided in the home. But there are many children who because of inherited tendencies, or unusual home environment, or both, fail to make normal progress in their development. These children we designate as exceptional or atypical when they deviate only in a small degree from the norm or type, and as subnormal, abnormal or defective when the deviation is marked and permanent.

Educators are realizing more and more that special teachers, special schools and special methods must be provided for the exceptional children and a beginning has been made in providing these special facilities. The field is comparatively new and presents many problems yet unsolved. There are numerous institutions for definitely abnormal or defective children but there is a need of facilities for the detection and proper education of exceptional children who are not abnormal.

As a general proposition it seems unwise to mix exceptional children of the pseudoatypical and atypical category with the definitely abnormal or defective. The normal, but exceptional children often need the companionship and stimulus of normal children which are not exceptional, but they must have special care in the hands of teachers qualified for such work. This implies small classes, and a large amount of individual supervision. A few small private boarding schools and summer camps are doing this work, but there is need and a growing demand for increased facilities to care properly for the large number of children in need of these special educational opportunities.

I shall attempt here to report some general observations on boys who are normal except for certain deviations resulting from unfavorable home environment, and also a somewhat detailed report of an atypical boy.

The normal boy showing deviations from the type is frequently the only child of well-to-do or wealthy parents. In many instances the mother is nervous and over-indulgent. The father may be over-indulgent also, but in most cases he attempts to counteract the mother's indulgence and thereby arouses antagonism which often leads to friction and lack of mutual confidence.

A boy living under such a home environment may present a number of undesirable symptoms, such as retarded growth from

injudicious diet, selfishness, irritability, contrariness, and lack of self-reliance and consideration for the rights of others. A boy who presents these symptoms and is allowed to remain without interruption in the environment which produced this condition, is in great danger of growing up to manhood with undesirable traits of character permanently fixed.

It is remarkable how quickly these symptoms disappear when boys are placed in a wholesome environment. A number of such boys have come under my observation in a boys' camp where the simple, active outdoor life, association with wholesome boys and men, regular discipline, plain, nourishing diet, systematic physical training and constant supervision serve to restore the boys very quickly to a perfectly normal condition.

Of course, there are marked individual differences; some boys adapt themselves at once to the new environment, while others find adaptation more difficult.

One of the strongest factors in the education of exceptional boys is the keen desire in every boy's heart to be well thought of by his comrades. A boy quickly discovers his weaknesses, shortcomings and peculiar traits when thrown in the midst of normal and wholesome companions. The desire to win the approval of his comrades and the normal ambition to excel in competition with them constitute valuable agents available to the educator who seeks the normal physical, mental and moral development of boys entrusted to his care. All activities of camp life, such as baseball, tennis, athletics, swimming, rowing, canoeing, boxing, woodcraft, and campercraft enter into the educational program. A boy kept busy with these physical activities is usually a good boy, especially if these activities are wisely planned and judiciously administered. The results obtained are, in general, health and vitality, physical accomplishments, self-reliance, adaptability, unselfishness, courage and perseverance.

One definitely atypical boy was entrusted to my care. He was fifteen years old, somewhat below the average in weight and height, and much below the average in strength, muscular development and coordination. He was about two years below grade in his school work although he manifested marked precocity in geography and history, and unusual interest in political and social problems. He had read widely in these subjects and delighted in discussing questions of national and international politics.

The boy had no interest or experience in any of the plays and sports which interest boys. He spent practically all his time in devouring books on his favorite subjects.

Although brought up in a home of culture and refinement, he was careless in dress and personal habits. He was self-centered, proud and reticent; but, except on rare occasions, he was docile and obedient.

My greatest difficulty was to interest the boy in the camp activities which were so necessary to his development. He maintained an attitude of absolute indifference to the games and sports which absorbed and delighted all his comrades. He considered himself different from other boys and believed that it was useless for him to try to overcome his shortcomings.

I directed my efforts to winning the boy's confidence and friendship in order that I might persuade him to cooperate with me in my plans for his welfare.

Patience, sympathy, and perseverance ultimately succeeded and the boy entered heartily into the program of activities arranged to meet his special needs. In a few weeks he learned to swim, to handle a boat and canoe, he learned to jump and run, and was able to take share in the various camp activities. He gained twelve pounds; two inches in girth of chest, and proportionately in other measurements. There was a marked increase in general strength and considerable improvement in personal appearance.

When the boy left the camp to return to school, he was not yet up to normal, but he was no longer a pessimistic, indifferent and discouraged boy; he had made a splendid start in gaining health, physical accomplishments, ability to live happily with his fellows, and, he had won the respect and good will of his comrades.

REVIEW.

CASE HISTORIES IN PEDIATRICS. A collection of Histories of Actual Patients Selected to Illustrate the Diagnosis, Prognosis and Treatment of the Most Important Diseases of Infancy and Childhood. By JOHN LOVETT MORSE, A. M., M. D. Assistant Professor of Pediatrics, Harvard Medical School; Associate Visiting Physician at the Infant's Hospital and at the Children's Hospital, Boston. Octavo of 314 pages. Boston: W. M. Leonard, Publisher, 1911. Price, \$3.00.

There is no method of teaching so valuable to the student, be he graduate or undergraduate, as instruction by the bedside and

close to this comes teaching by the careful presentation of facts to be learned by the study of the typical case. One of the great advantages of this arrangement is that it compels the student to think and act for himself. Dr. Morse has employed it with signal successes in his classes at the Harvard Medical School and in the volume before us, the popularity of which has been so great as to require three printings since its first appearance in February, 1911, less than one year ago.

The book is made up of one hundred actual histories selected to present concisely, thoroughly, and in a most interesting way, a clinical review of the diseases of children. Each case is presented under the captions: History, Physical Examination, Diagnosis, Prognosis, and Treatment.

The scope of the volume is shown by the following list of its sections:

Section I, Cases 1-9, Diseases of the New-born; Section II, Cases 10-29, Diseases of the Gastroenteric Tract; Section III, Cases 30-35, Diseases of Nutrition; Section IV, Cases 36-47, Specific Infectious Diseases; Section V, Cases 48-54, Diseases of the Throat, Nose, Ears, and Larynx; Section VI, Cases 55-61, Diseases of the Bronchi, Lungs, and Pleuræ; Section VII, Cases 62-67, Diseases of the Heart and Pericardium; Section VIII, Cases 68-70, Diseases of the Liver; Section IX, Cases 71-76; Diseases of the Kidneys and Bladder; Section X, Cases 77-82, Diseases of the Blood; Section XI, Cases 83-96, Diseases of the Nervous System; Section XII, Cases 97-100, Unclassified Diseases.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Open-air Rooms and Schools.—T. F. Leen (*Bost. Med. and Surg. Jour.*, 1911, clxv, 630) sums up the principal problems in connection with open-air schools as follows: The first and most important thing is to get exact knowledge of the physical condition of the school children. This can best be accomplished by the making of the department of school hygiene under the school committee a real medical inspection department with full charge of the school medical inspectors, thus giving the school committee complete charge of the children under their care. Next, the establishment of open-air rooms for anemic children, in which rooms, if food is to be given, it shall be supplied by the parents, or in cases of necessity by private charity. The turning over to the proper authorities for hospital care all children, association with whom would be dangerous to the other pupils. We should more generally open up the windows and roofs to all the children in the public schools, and when children are found who are not

getting proper food at home, and whose parents say that they cannot provide the school luncheons as required by the schools, careful examination should always be made to ascertain why such parents are really unable to provide the food, and the reason therefor; so that in case of need it may be provided by private charity.

Intestinal Infantilism of Herter.—The symptoms that Herter found in cases of intestinal infantilism are: An arrested development of the body. The child stops growing as it stops gaining in weight. On the other hand, the mental development of the child is fair. Marked abdominal distention is common, often with dilation of the abdominal veins over the upper part of the abdomen. There is usually a moderate anemia, and very characteristic marked fatigue. The intestinal symptoms are a tendency to looseness of the bowels, with occasional attacks of diarrhea, often with fatty stools, although there may be but little fat in the food. They are apt to have excessive appetite and thirst, an increased secretion of urine, and usually have cold hands and feet. Symptoms of rickets may be present. Herter found in these cases an absence of the ordinary bacterial flora of the intestines of young children; that the dominant organisms present are Gram-positive organisms; that the prevailing organism is the *Bacillus bifidus* of Tissier. With two others, the *Bacillus acidophilus* and the *Bacillus infantilis*, which latter may possibly be a variation from the *Bacillus bifidus*. The *Bacillus coli* and the *Bacillus lactis aerogenes* are infrequently found during the active stages of this disorder. The examination of the feces shows an excess of fat out of proportion to the amount taken in the food, a large amount of fatty acids and soaps. The urine of these children also shows characteristic changes. The amount passed in twenty-four hours is large. There is a rise in the ethereal sulphates, a pronounced indicanuria and excessive phenol and the presence of large amounts of aromatic oxyacids. R. G. Freeman. (*Amer. Jour. Dis. Child.*, 1911, ii, 332) records four cases of this condition. He says that considering the previous history of diarrhea, the evidence of intestinal putrefaction, with the peculiar flora of the intestines, and the high ethereal sulphates in the urine, it seems that the lack of growth is really due to an intestinal condition that interferes with a proper absorption of food in the bowels and this interferes with an increase in weight.

Caloric Needs of Premature Infants.—The remarks of J. H. Hess (*Amer. Jour. Dis. Child.*, 1911, ii, 302) are based on a study of seventeen cases. He states that for the premature and under-weight infant, the energy quotient needed varies inversely with the age and birth-weight, the energy quotient averaging between 115 and 170 in those below 1,500 gm. and 100 and 132 in those over 1,500 gm. These figures are not arbitrary, and, of all things, should not lead to an attempt to feed these values in the first few days of life. At first not only should the caloric value of the food be low, but the quantity of each feeding

should also be small. These infants, therefore, should be fed small quantities, frequently repeated, *i.e.*, every one and one-half to two hours during the day and two to three hours during the night, according to the development of the individual, with special reference to the digestive organs, stools, urine and presence or absence of vomiting. On the first day following the first bowel evacuation the human milk may be fed diluted with one or two parts of water or sugar, with a caloric value approximating thirty. From the second day on, in the absence of indigestion, the food may be increased by ten calories daily. In the presence of digestive disorders greater care is necessary and it may be necessary for some days to hold the feeding in the neighborhood of ninety, approximately the amount necessary to maintain the metabolic equilibrium. After ten to fifteen days an attempt should be made to hold the figures, in the infant weighing less than 1,500 gm., to 120 to 140, and in those weighing over 1,500 gm. at between 110 and 130; but in all cases the infant itself should never be lost sight of, and more especially the stools and weight. Higher caloric needs of the premature are due to two factors—larger body surface proportionate to size and the consequent increased metabolic requirements. It is quite necessary that all be provided with artificial heat whether from incubators, electric pads or hot-water bottles, sufficient heating being used to cause the temperature to approach the normal. In incubators this ranges from 78° to 90° F. One other important factor is a sufficient water-supply to counterbalance the rapid evaporation due to artificially heated and dried air and the excessive excreta of the first few days. The writer has endeavored to administer about one-sixth of the body weight of water, inclusive of that in the milk in twenty-four hours. Disturbed metabolic balance with a standstill in the weight-curve and indigestion with bad bowel movements frequently resulted when 140 calories per kilo were exceeded. All intestinal disturbances in premature infants should be treated as if they were atrophic infants, as they do not stand starvation well. Artificial feeding of these infants should be discouraged in all cases in which the infant is born at thirty-six weeks, or under. Artificially fed, full-term infants require a higher food-value than the same infants at the breast, the average added requirement being ten to twenty calories per kilo, which would also hold true in premature infants, and this adds materially to the dangers of this method of feeding. The energy quotient needed to maintain the metabolic equilibrium ranged quite close to ninety, while in the full-term infant seventy is usually sufficient. In all cases of prematurity syphilis should be thought of and in cases in which there is the slightest suspicion, the infant must not be placed directly on the breast.

Infectivity of the Secretions and the Desquamating Scales of Measles.—Continuing their previous experiments (see abstract, AMER. JOUR. OBST., Oct., 1911, 723) and attempting to determine the duration of infectivity of the nasal and buccal secretions in

measles, J. F. Anderson and J. Goldberger (*Jour. A. M. A.*, 1911, lvii, 1612) have made inoculations into monkeys from five additional cases. They found the nasal and buccal secretions in three cases were not infective for the monkey and that those from two cases may have been mildly infective, but a definite interpretation is not possible. Combining the results obtained in the writers' first two experiments with those of the five here reported it would appear that the nasal and buccal secretions of uncomplicated cases of measles may be at times, but are not always, infective for the monkey. The writers made three attempts with epidermal scales to inoculate monkeys with measles. The absolutely negative results of these three experiments would indicate that the "scales" employed were not infective for the monkey. Alone these experiments would hardly justify the inference that the desquamating epidermis in measles is not infective for man; but when viewed in the light of Mayr's negative results in attempting to inoculate children with measles by using the desquamating epithelium, the present writers believe it highly probable, if not altogether certain, that the desquamating epithelium of measles, in itself, does not carry the virus of the disease.

Parathyroid Glands in Relation to Infantile Tetany.—R. W. Bliss (*Arch. Pediatrics*, 1911, xxviii, 892) states that the special relation of infantile tetany to the parathyroid glandules is very obscure. The finding of hemorrhages by various investigators in cases of infantile tetany, throughout the glandular tissue is interesting. He has removed the parathyroid glandules in thirty-five cases ranging in age from birth to nine years. Of these, twenty-two, including two cases of infantile tetany, were prepared and examined microscopically. In the two cases of definite infantile tetany four glandules were present in one and three in the other. In not one of these seven glands were hemorrhages found.

Renal Functions in the Course of Nephritis of Childhood.—P. Nobécourt and Prosper Merjklen (*Arch. de méd. des enfants*, September, 1911) distinguish four forms of nephritis, acute or chronic, in children according to how the elimination is effected. In the simple albuminous form chlorides and urea are both eliminated normally; albuminuria may be slight or marked; but this is the only sign of change in the kidney function. In the chloruremic form, in which there is a retention of chlorides, there is edema of all parts of the body, lungs, thorax, larynx, and brain, and convulsions, accompanied by digestive disturbances. In the azotemic form the symptoms are mainly digestive—anorexia and vomiting—with retention of urea. In the combined form there are symptoms of both the other forms, and diminished elimination of both chlorides and urea. These are the severe cases with cardiovascular symptoms and bad prognosis. The prognosis is good and treatment of the simple form is easy; rest and a milk diet, which need not be absolute, is

sufficient. In the chloruremic form the prognosis is good unless long continued, when anemia and cachexia develop. In this only water is given at first, then milk diet, and finally if improvement does not occur albuminous substances. In the uremic form also milk is used. In all forms of nephritis milk is the suitable diet.

Ironsajodin in Children's Therapeutics.—Carl Beck (*Arch. f. Kinderheil.*, 1911, Bd. lvi, H. 55) has made use of the new preparation ironsajodin in children and finds it of great value. The iron acts as a carrier of oxygen for the hemoglobin, and the iodine increases the oxidation through the glands. The author has used the preparation in 100 cases, but reports only twenty-five in which he had the entire care of the patient. The children took the tablets willingly. Histories of the cases with curves of the hemoglobin content are given which show the increase in the amount of hemoglobin. Difficult children were given the tablets in their milk or in broth. It caused constipation in a number of cases; the general condition, appetite and color were improved in all cases at the end of a month or two of treatment.

Scarlatina Vaccination and Angina.—G. E. Wladimiroff (*Arch. f. Kinderheil.*, 1911, Bd. lvi, H. 55) gives his experiences with the use of the scarlet fever vaccine of Gabritschewsky, produced by vaccination with a bouillon culture of scarlatinal streptococci heated to 60° and mixed with a small amount of phenol. It is as yet so uncertain whether the streptococcus is the cause of scarlet fever, or only an accompaniment of the causal organism of the disease, that careful interpretation of results is essential. Angina and erysipelas are true streptococcic infections. An attack of angina does not make the patient immune to a second attack, while an attack of scarlatina does confer immunity. The author tested this vaccination in a child who had prodromal symptoms, vomiting, rise of temperature, angina, exanthem, and eruption on the body, spreading in one day all over the body, leaving out the chin, lips, and nose, as is the case in scarlet fever. The eruption was seen also on the palate and throat. The symptoms lasted four days. Here we have a symptom complex similar in all respects to scarlatina, but more rapid in development. The strawberry tongue was present on the second day, instead of at the end of a week. It would seem from this observation that the scarlatinal streptococcus plays the principal rôle in the etiology of scarlatina. The serum of Moser has as its basis the same streptococcus and its curative value has been shown. The angina of scarlet fever often places the physician in a delicate position; if he says that it is true scarlatina he must maintain quarantine for a long time at great inconvenience; if he does not he risks infection to many children in schools and houses. The author thinks that his experiments have shown that these anginas are true scarlatina, and should be treated and isolated just like cases of the disease with the eruption, since the vaccine angina is exactly similar to it. It should also be used

as a prophylactic measure against the severe symptoms of this disease. This vaccination is quite harmless in well persons, with healthy kidneys, and not in the incubation period of scarlatina. The medium dose is for two to five years, 0.3 c.c.; for five to ten years, 0.5 c.c.; ten to fifteen years, 0.7 c.c. This vaccine should be widely tested in practice that we may learn its effects as a curative and a prophylactic treatment. It should be handled only by physicians after a careful examination of the physical condition of the patient, the urine having been tested, and the temperature taken.

Transplantation of a Portion of the Tibia into the Spine for Pott's Disease.—In order to imitate and accelerate the ankylosis by which Pott's disease is arrested, F. H. Albee (*Jour. A. M. A.*, 1911, lvii, 885) has, in three cases, transplanted a portion of the tibia into the spine. An incision is made, directly over the tips of four spinous processes, with the kyphosis in the center. Each process is split longitudinally for about one inch and a quarter into two portions with one-third of the process on the left and two-thirds on the right. The soft tissues between the processes are merely separated by blunt dissection or by a scalpel, parallel with the muscles. Green-stick fractures are then produced at the base of the one-third portions of each of the processes. A wedge-shaped cavity is thus produced, ready to receive the bone graft. A compress of hot saline is placed over the wound while a prism-shaped piece of the tibia from its anterior-internal aspect is removed by means of a chisel, with the periosteum intact on two of its surfaces. The graft is quickly removed and immediately placed in the interval between the portions of the spinous processes. The dense fascia over the tips of the processes is then approximated by interrupted sutures of No. 3 chromic catgut, thus holding the bone-graft very firmly in place. The skin is closed by a continuous suture of No. 1 plain catgut. A firm bony splint with bony union to the vertebra involved and the healthy vertebræ on each side is supplied by this method, which assures not only the prevention of further deformity in two mechanical ways (leverage and splint action), but should also cause the immediate disappearance of the tuberculous process. This method is believed to be preferable to any, where breaking or cutting of the spinous processes destroys entirely, or for the time being, until union takes place, the desired leverage of the spinous processes and their muscles and ligaments. Union is also uncertain where motion from breathing is present. Perfect immobilization of the few involved vertebræ in the respiratory area of the spine is secured, which is a mechanical impossibility by means of any external apparatus, on account of the constant movement of the ribs, and the vertebræ attached. The normal leverage action of the spinal muscles and the supporting ligaments on spinous processes is not interfered with. When possible it is well to secure a recession of a kyphosis by long recumbency on a reversely bent Bradford frame.

This method offers great promise of holding the correction obtained. A bone-graft is far superior to an internal metal splint, because, by following Wolff's law it will become thicker and stronger if necessary to hold the weight or strain brought to bear on it, whereas in the case of an internal metal splint, suture or screw applied to the bone, no dependence can be placed on them to hold weight or strain, because of the bone atrophy and absorption which takes place directly around the metal. This occurs even when no strain is present.

Nasal Diphtheria in the Child.—M. Biehler and Bogdan Korybut-Daszkiewicz (*Arch. de méd. des enf.*, Nov., 1911) think that nasal diphtheria is not uncommon in young children. It is shown by an obstinate nasal discharge which excoriates the lip. There is no membrane in the throat, little fever, and general symptoms are not marked. The author gives histories of nine cases and his conclusions. The rational treatment is the injection of antitoxin. It rarely spreads to the pharynx and larynx. In every obstinate catarrh we should make cultures from the nasal secretion. Before operating on the nose of a baby we should make a culture from the nasal secretion.

Spasm of the Glottis the Sole Symptom of Tetanus.—Triboulet and Harvier (*Ann. de méd. et chir. inf.*, Nov. 15, 1911) state that laryngospasm may be observed in the child without other tonic or clonic manifestations of tetanus, and only the electrical reactions will permit a diagnosis. The sign of Chvostek is never present in these cases. The authors have studied ten cases of this condition. Spasms that are attributed to pressure of an hypertrophied thymus may be due instead to tetanus.

Adenoid Vegetations in Babies.—A. Sargnon, J. Gaté, and M. Durie (*Gaz. des hôpitaux*, Oct. 21, 1911) state that in the early months of intrauterine life the pharyngeal tonsil is represented by a diffuse lymphatic infiltration; about the ninth month follicles are first seen. This tissue gradually develops up to the fifth year of life when it attains its maximum development. At twelve months it occupies the entire vault. When tonsils and adenoids are hypertrophied we have not only a mechanical obstruction, but a derangement of the internal secretion of the vascular glands. These adenoid tumors are soft and of a pale rose color. Marfan thinks that there is a relation between adenoids and rickets. The infant experiences difficulty in respiration and in alimentation, which render him anemic and cachectic. There are nervous infants in which laryngospasm is a prominent feature of the adenoid diathesis. The complications are catarrhs of the pharynx, middle ear, and bronchial tubes. When there is a frequent rise of temperature the treatment should be first of all medical; antiseptics should be used locally. Later, ablation should be practised.

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ORIGINAL COMMUNICATIONS.

CESAREAN SECTION AND ITS ALTERNATIVES IN SUSPECT AND SEPTIC CASES.*

BY

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GIVEN a clean birth canal, favorable surroundings, and an operator accustomed to abdominal and pelvic work, abdominal Cesarean section should not carry with it a mortality or morbidity greater than that accompanying a nonseptic abdominal, gynecologic operation. On the other hand, in septic cases the mortality of Cesarean section even with good surroundings and a skilled operator is far greater than that resulting from abdominal surgery on the septic nonpuerperal woman. This being so, it has seemed worth while to consider Cesarean section and its alternatives where the uterus must be emptied and where the woman is either undoubtedly septic or where the obstetrician is in doubt whether sepsis exists or not, that is, in "suspect cases."

The whole question is important because while the trained obstetrician is fully alive to the disastrous results of the various forms of abdominal Cesarean section in the presence of sepsis, many practitioners totally fail to grasp the situation. To them a Cesarean section simply means removal of the child by the abdominal route when it either will not go through or cannot be dragged through the natural passages. Experience has taught them that they can do almost any operation below the pubic arch with little or no attention to aseptic technic, yet some-

* Read before the St. Louis, Mo., Medical Society, December 16, 1911.

how the patient has managed to survive. Hence, if they have had hard luck and been unable to drag the child through the pelvis, they see no good reason why they should not summon an operator or carry the patient to him and have him remove the child, whether dead or alive, by means of an abdominal incision. That I am not exaggerating can be proved by the testimony of almost any abdominal surgeon who is asked to see such cases in consultation or to whom such cases are referred. Which of you who do such work has not been asked to perform Cesarean section upon a woman with swollen, blackened, lacerated vulva, produced by long and repeated attempts at extraction of a child who has long since died from the unskillful manipulations? And when you refused and insisted upon craniotomy, have you always been able to dispel from the mind of the practitioner a lingering doubt as to whether your decision, after all, was not based upon your fear of the abdominal procedure? Much more true is this if the child be alive. Then the practitioner knows you are making a mistake, for he has accepted as a truth the catch sentence that never under any circumstances is it justifiable to perform craniotomy on the living child. It is so much easier to apply a universal rule, whether right or wrong, to all cases than to study the indications and contraindications of a certain mode of procedure.

In speaking thus I am not afraid of being misunderstood. I have on more than one occasion expressed my admiration for the skill and ingenuity of the American obstetrician, the general practitioner. But there are all kinds and descriptions of practitioners and many who need fundamental facts continually set before them, if certain errors are to be eradicated. For only in this way can the improvement of present conditions be secured. The hope for better results in the surgical treatment of carcinoma of the uterus depends upon the early recognition of the disease by the practitioner who first sees it. The hope for an improvement in the results for mother and child where there is a disproportion between the head and the pelvis, lies in the early recognition of the condition by the practitioner and his adoption of procedures which will insure an aseptic birth canal.

In the following consideration of Cesarean section for septic or suspect cases, it will be best to confine our remarks to the most frequent indication for the operation, a disproportion between the fetus and the maternal pelvis. However, our conclusions equally well apply to other conditions calling for Cesarean section

where the child must be removed from a birth canal, either septic or in such a state as to readily lead to sepsis.

It is apparent that cases of contracted pelvis, where the fetus is of ordinary size, can be roughly divided into two classes, first, where the conjugate vera is 5 cm. or less; second, where the true conjugate is above 5 cm. but less than normal. In the first class of cases there is an absolute indication for the suprapubic removal of the child, since its delivery through the extremely contracted pelvis even after embryotomy is performed is either impossible or attended by extreme danger to the mother. It is not within the province of this paper to discuss the relative indications for Cesarean section, that is, where the pelvic measurements give a true conjugate of 6 or 7 cm. or over. The discussion in both classes of cases presupposes a contracted pelvis with a birth canal either surely infected or liable to infection from what has gone before. What must be kept clearly in mind is that in the first class of cases, because of the marked contraction present, some form of suprapubic operation is a necessity, while in the second class, Cesarean section may be avoided by substituting pubiotomy or craniotomy either on the dead or the living child. Fortunately, cases of pelvic contraction marked enough to contraindicate operations from below are comparatively rare, so that the obstetrician is not often compelled to deliver by the suprapubic route. On the contrary, in the vast majority of cases he can choose his operation and his results will depend upon his grasp of the situation confronting him.

It has long been recognized that the results of Cesarean section vary according to the time in reference to labor the operation is performed. Reynolds showed from his analysis of 289 cases that where the operation was performed prior to labor, the mortality was 1.2 per cent., while late in labor 12 per cent. of the patients died. Others have shown the same thing. It remained for Routh of London, however, to furnish the most convincing figures. From his list of 1282 cases of Cesarean section performed by over 100 living obstetricians and gynecologists in the United Kingdom. He found that where there had been repeated vaginal examinations or where attempts had been made to deliver by means of the forceps the mortality was 34.3 per cent. When the patient was in labor and the membranes ruptured but with no attempt at delivery from below, the mortality after Cesarean section was 10.8 per cent. When the patient was not in labor with the membranes unruptured the mortality was 3.6 per

cent., and when the patient was in labor with the membranes unruptured the mortality was 2.2 per cent. Combining cases not in labor with those at the beginning of labor with membranes intact, the mortality was 2.9 per cent., whereas in the cases where the membranes were ruptured or where repeated examinations or attempts at delivery had been made the mortality was 17.3 per cent.

With such a large number of cases these figures can signify but one thing. Repeated examinations and attempts at delivery mean sepsis and this in turn means a high mortality no matter whether the classical or other varieties of Cesarean section be performed.

The danger of sepsis from repeated examinations and attempts at delivery has long been recognized. The danger of sepsis from a mere rupture of the membranes with no undue manipulation from below has not been universally appreciated. My attention was called to this danger about twelve years ago, when the death of a relative could only be explained by sepsis resulting from a premature rupture of the membranes two days prior to the onset of labor. Careless technic on the part of the attendant in this case could be absolutely ruled out. With this example in my mind I have since taken extra precautions against sepsis in my private and hospital work, whenever there was a premature rupture of the membranes. In spite of this, my assistant, Dr. George Kamperman, found in a series of 300 cases at the University of Michigan Maternity that sepsis, as indicated by a rise of temperature which could not be otherwise explained, was much more frequent after premature than after normal rupture of the membranes. Mild sepsis occurred eight times more frequently after premature than after normal rupture, while severe sepsis was twenty times as common. To be sure these are purely clinical observations and therefore liable to error, yet such as they are it would indicate that sepsis is more common after premature rupture of the membranes. These clinical observations are being checked up by microscopic and bacteriologic examinations of the amniotic fluid following premature rupture and a report of the findings will be made later.

It is very difficult to classify clinically cases of sepsis in their relation to Cesarean section for the reason that comparatively mild cases may develop marked sepsis after the operation and *vice versa*. Still, in a general way, we may recognize the following kinds of cases.

1. Cases of undoubted sepsis. History of repeated examinations and attempts at delivery by persons whose technic is open to suspicion. Fever, increased pulse rate, lacerated and swollen soft parts and a foul vaginal discharge.

2. Cases of probable infection. Repeated vaginal examinations and some attempts at delivery. Ruptured membranes. No fever, no foul vaginal discharge.

3. Possible cases of infection. True "suspect cases." History of rupture of membranes with no examinations or unruptured membranes with numerous examinations, no attempts at delivery. No fever, no foul discharge.

There are cases, no doubt, which cannot be placed in any of these divisions, but on the whole it seems a fair classification of the cases where the operation of Cesarean section has to be considered. I shall speak later of bacteriologic examinations as aids in the classification of such cases.

The history of Cesarean section shows a constant endeavor to overcome the high mortality resulting from sepsis. In the preantiseptic days the classical Cesarean section was given up because of its poor technic and the resulting high mortality. Then came the Porro operation with amputation of the uterus and the stitching of the cervical stump into the lower angle of the wound. This gave better results because it removed what was in most cases a septic organ. Next in order came the Sanger conservative operation, the principle of which was the preservation of the uterus after proper suturing of the uterine incision. With the perfection of abdominal surgery this operation became very popular and gave good results except in the cases under consideration, where the uterus or some portion of the birth canal was septic. Operations under these conditions gave a high mortality and led to a return to the Porro operation with a burying of the cervical stump beneath the peritoneum. The removal of the cervix or panhysterectomy was a modification of this technic, still with the object in view of guarding against fatal peritonitis from the septic uterus. The latest attempt to reduce the mortality in the presence of sepsis is extraperitoneal Cesarean section. The purpose of this operation is to incise the pregnant uterus beneath the peritoneum in order to prevent the soiling of the latter with the contents of the septic organ.

With these various operations to choose from what shall be the mode of procedure in the three classes of cases described above, where it has been demonstrated that the natural forces

are inadequate to force the intact head through the relatively small pelvis? In the first class, where sepsis is pronounced, no suprapubic operation should be considered except in the rather rare cases where marked pelvic deformity makes delivery from below impossible or highly dangerous to the mother even after craniotomy. The classical Cesarean section is not to be thought of for an instant, for the danger of peritoneal soiling and resulting peritonitis is marked, even where the uterus is lifted outside of the abdominal wall before it is incised. Experience has shown that it is almost next to impossible to entirely protect the peritoneum from such soiling by the use of gauze packs, etc. Even if the patient escape this danger, the septic uterus is only too apt to cause nonhealing of the uterine incision with subsequent escape of septic material into the abdominal cavity, followed by death from general peritonitis. The results of the modified Porro operation are better because the septic uterus is removed, but the danger of peritoneal soiling from the incision of the uterus still remains. That extraperitoneal Cesarean section has not proved much more satisfactory is shown by Sellheim's suggestion that in these very septic cases after the extraperitoneal delivery of the child a uteroabdominal fistula be formed to secure drainage. No matter what form of suprapubic operation is chosen in these markedly septic cases, the results are disastrous to the mother and only slightly favorable to the child, who may be saved primarily only to die later of septic pneumonia or some other complication due to the septic condition of the amniotic fluid.

The only course to pursue under these conditions is to perforate the child, living or dead, and extract from below. Craniotomy may not save the life of the mother, for in such septic cases it carries with it a mortality of from 10 to 15 per cent., but at least it gives the mother an infinitely better chance than can any variety of Cesarean section.

This is not the place to discuss the ethics of craniotomy. Rightly, as obstetrics has developed, especially since the perfection of obstetric operative technic, a greater and greater value has come to be placed upon fetal life. Ruthless and senseless sacrifice of the life of the fetus is more and more deprecated. No discussion of operative technic is considered complete unless it takes into account the fetal as well as the maternal mortality resulting from the operation. Preference is given to that technic showing the lowest fetal mortality and morbidity, provided, and here is the gist of the matter, the moth-

er's life be not too greatly jeopardized thereby. It is just as well to be honest regarding this matter. In reality if it becomes a choice between the mother and the unborn child, the mother is always given the preference. Personally, I have never failed to see religious, theoretical and academic arguments cast to the winds, when the matter is put to the test. The natural cry of every true husband in such a crisis: "Save the child if you can but first of all save my wife," is based not merely upon sentiment but something far more fundamental. Procreative instinct proclaims the truth, that it is best for the mother to survive in order that some future ovum under more favorable surroundings may issue from the mother and survive. With the mother dead and the fetus surviving it is, to say the least, problematical, whether the latter will survive and reach maturity. Hence, every way the question be considered the mother should be given the preference when it becomes a choice between the two lives.

Where the mother is septic from repeated examinations and attempts at delivery, the child has very little chance of survival under any circumstances. It has either been rendered feeble by attempts at extraction or the long, ineffectual labor, or its life is seriously jeopardized by the septic condition of the uterus. Common sense impels us to perforate a monster or badly deformed fetus, rather than to expose the mother to the risks of a Cesarean section. In the class of cases under consideration where the mother is extremely septic, her slight chances of recovery should not be taken from her by an operation from above, when the chances of the survival of the fetus are so very slight.

In the second class of cases of probable sepsis, where there is a history of repeated examinations and attempts at delivery from below but with no fever or foul vaginal discharge, there is room for argument as to what procedure should be adopted. At least, the indications do not call absolutely for a craniotomy upon the living or dead child and extraction from below. In this class of cases, the child is less feeble because the manipulations have been fewer. The mother is less septic as shown by the absence of fever, rapid pulse and foul discharge. Is there any way, except from the clinical symptoms, of estimating the degree of sepsis present? Accurate determination of the virulence of the septic organisms present is very desirable, for upon the degree of that virulence will depend the outcome of the case.

Routh considers at some length the possibility of detecting and

identifying the microbes by microscopic examination or stained smears, and comes to the conclusion that it is worthy of trial. But the recognition of even such an organism as the streptococcus does not definitely settle the question of the virulence of the process, although its presence generally signifies that the infection is virulent. The same applies to the staphylococcus and colon bacillus, although not to so great a degree. Unless we are prepared to adopt the rule of Bumm, also referred to by Routh, and perforate the child in all cases of contracted pelvis where there is fever present and bacteria are demonstrated, the most such an examination, referred to above, could avail would be to put the operator on his guard against a possible very virulent infection. But from the clinical facts alone he is on his guard nor does it need a demonstration of bacteria in the discharges to bring this about. I see no way of determining the degree of infection by means of a microscopic examination of the smears. Such being the case, while I would urge such examinations being made as aids to a proper sizing up of the case, I would deprecate any attempt to make the selection of the treatment solely dependent upon such examinations. In some cases it will be decided that with perfect fairness to the mother in the interests of the child some form of suprapubic delivery is justifiable. In other cases where the history points to the probability of the introduction of virulent organisms, especially if there exist a doubt as to the vitality of the child, craniotomy will be decided upon as the best procedure.

That the mother has certain rights in making the decision as to the course to be pursued, must never be lost sight of. In doubtful cases, after a full explanation, the mother has the right to decide upon the additional risks to herself in the interests of her child. On the other hand, the attendant is in duty bound to listen to the wishes of the parents in choosing craniotomy, reserving the right to protect the interests of the child when mere selfish considerations are made prominent.

As to the choice of operation in this second class of cases, I would unhesitatingly exclude pubiotomy. In the presence of sepsis this operation carries with it a high maternal mortality and morbidity, while the fetal mortality will always be considerable. I would reserve this operation for clean cases and only after a thorough test of labor.

As to the varieties of Cesarean section, the choice will lie between the modern modified Porro operation, a supravaginal

amputation of the uterus with a burying of the cauterized stump beneath the peritoneum, panhysterectomy and some form of the extraperitoneal Cesarean section. I must confess to prejudice against both the latter procedures in the presence of puerperal sepsis on account of the exposure to infection of large areas of connective tissue, a necessary accompaniment of each operation. A fairly extensive experience with these operations or what practically amounts to these operations in septic gynecologic operations on the nonpuerperal woman has led me to dread connective-tissue septic involvement. Much more serious are the sequellæ in puerperal cases where the infective agent is far more virulent. While theoretically, panhysterectomy may be the ideal operation, since it removes entire the septic uterus, I feel sure that practically the dangers of infection will be increased for the reason stated above.

The same may be said of the latest variety of Cesarean section, extraperitoneal or suprasymphyseal Cesarean section. Large areas of connective tissue are bound to be opened and exposed to infection whether the uterus be really reached extraperitoneally or the transperitoneal route be employed. It would seem as if those who have revived this operation, for it must not be forgotten that under the name of gastroelytrotomy it was performed in this country by Thomas, Skene, and others in the seventies, have yet to prove its value over the modified Porro operation. It is significant, however, that those who have had most experience with the operation are far from being in accord as to its virtues in the class of cases for which it is advocated. Certainly, if the dangers suggested were not real, Sellheim's uteroabdominal fistula modification would not have been suggested. Still, while theoretically opposed to the operation, I remain open to conviction and shall follow the results of the procedure in the hands of others with much interest.

The modified Porro is the operation of choice in the second class of cases. The greatest precautions should be taken to prevent peritoneal soiling by the contents of the septic uterus. With this end in view the abdominal incision should be made long enough to allow of the delivery of the uterus before the latter is incised. Prior to the incision, the uterus can be surrounded by numerous gauze packs to prevent contamination of the peritoneum. After the removal of the uterus the cervical stump should be thoroughly cauterized. A change of gloves during different stages of the operation will materially aid in preventing contami-

nation. With these and other precautions and with the septic organ removed, the danger of fatal peritonitis will be reduced to a minimum and in case the mistake of operating upon too septic a patient be not made the results ought to be fairly good.

Finally we come to the third division of cases, true "suspect" cases. Here the membranes may or may not have been ruptured. Examinations may or may not have been made. The patients have no fever, no foul discharge, no clinical evidence of sepsis. Still, from their histories they are open to suspicion. They are not ideally clean cases such as one would choose for elective Cesarean section. Classical Cesarean section is permissible here, extra precautions being observed to guard against sepsis. In these cases, it is well to deliver the uterus prior to incision, carefully protect the peritoneum and adopt other measures assuring success. Munro Kerr suggests the pushing of the placenta and membranes through the dilated cervix rather than removing it across the incised uterine wall. An assistant removes it from below. This appeals to me as distinctly a surgical suggestion and at the first opportunity I shall practise it. On the contrary, Maxwell's suggestion, acquiesced in by Routh, of washing out the ruptured amniotic sac from below with normal saline solution, does not appeal to me. It is not possible to cleanse such an irregular cavity, and in my opinion more harm than good will result from such a practice. When the cavity is as septic as that, it belongs to the first or second divisions, where grave doubts will always arise as to the advisability of the section.

In this rather cursory review of the subject I have intentionally refrained, as far as possible, from quoting statistics. My object has been to emphasize the single fact that abdominal Cesarean section is always exceedingly dangerous in the presence of sepsis; that at times it is absolutely unjustifiable, craniotomy on the living or dead child being the preferable procedure. Finally, my object has been obtained, if my setting forth of the subject shall give rise to full discussion wherein each man shall give expression to his views according to his individual experience. Only by such full discussions can we hope to progress in this or any other obstetric topic.

INTERPRETATION OF UTERINE CURETTINGS.*

BY

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MANY pelvic symptoms, but especially hemorrhage and leukorrhea, are treated in a routine way by curettage. The specimens obtained are then sent to the pathologist, and after a due interval a report is returned with the diagnosis of "endometritis." Thus the clinician is encouraged to continue this empiric treatment without self criticism.

In 1908 Hitschmann and Adler published a paper, "The Structure of the Normal Endometrium with Especial Reference to Menstruation," which called for a thorough revision of the views held by both clinicians and pathologists. Abroad this paper aroused great interest and has been the basis of considerable research. In this country, with only few exceptions, it has been practically ignored.

My purpose this evening is to again attract your attention to the subject of the uterine mucosa and its inflammations, to review some of the papers published during the last five years, and then to reduce such facts as will bear the test of searching inquiry to their simplest factors, in order that we may apply them to practical every day use.

Mainly to Hitschmann and Adler belongs the credit of having drawn the attention of the profession to the fact that the mucosa of the normal human uterus undergoes regular periodic changes, some of which are evident to the unaided eye, others only observed with the aid of the microscope. They studied these variations and were able to divide them into four main phases.

1. The *premenstrual stage*, which begins six to seven days before the bloody flow appears, is characterized by distinct thickening of the mucosa. The mucous membrane can be divided into a superficial compact and deeper spongy layer. The microscopic picture is dominated by the evident *secretory activity*. The glands are numerous, large and tortuous. Their epithelium is distended, encroaches into the lumen, forming "pseudopapillæ." The stroma consists of large translucent cells which we call decidual in type.

* Read at the Meeting of the N. Y. Obstetrical Society, Nov. 14, 1911.

2. As the time of *menstruation* approaches vascular engorgement becomes more marked. With the onset of the menses red blood cells appear, first in the superficial layers of the endometrium, then in the cavity of the uterus. The hemorrhage produces rapid deturgescence, and emptying of the glands.

3. The next stage, the *postmenstruum*, is a short period of comparative inactivity and rest. The mucosa appears thin and pale. The glands are straight, simple ovals in contour, lined with low columnar epithelium. The stroma is mainly composed of spindle cells. Secretion is entirely absent.

4. The final stage, or *interval*, is characterized by renewed cell activity. Mitotic cell division abounds. The glands increase in size, are at first corkscrew in shape, later, as the tortuosity progresses, they approach the bizarre and irregular premenstrual type. The epithelia, likewise, develop increasing activity with production of intracellular secretion, and the stroma cells become more succulent and translucent.

Thus Hitschmann and Adler described the normal cycle. They also recognized considerable variations, within physiological limits, and, furthermore, observed that glands are more numerous at the fundus and upper portion of the uterus.

It is evident from the foregoing that the picture presented by the normal endometrium is complex and difficult to interpret. The difficulty is enhanced because we usually have to examine small, detached fragments of the mucosa. Furthermore, when we attempt to recognize signs of chronic inflammation, which manifest themselves by exudation, vascular and stroma changes, in a constantly changing medium, the task closely resembles that of analyzing individual poses in a rapidly passing kinetoscope film.

Hitschmann and Adler were correct when they showed that what was hitherto called "glandular hypertrophic or hyperplastic endometritis" was frequently identical with the late part of the interval, or, if the gland changes were more advanced, with the premenstrual change, and that the picture usually interpreted as "interstitial endometritis" was the normal mucosa in its state of repose, the postmenstruum. Carried away by their valuable discovery, they, however, went too far, and denied that such changes as gland hypertrophy ever occurred.

Of course they realized that chronic inflammations of the endometrium could occur, but, because the normal picture is constantly changing, inflammation of the mucosa would be diffi-

cult to recognize. According to them, the sole criterion of chronic inflammation in the uterine mucosa is the plasma cell, which has an affinity for selective stains, and, therefore, cannot be mistaken.

The chief problems, which engaged those investigators who subjected Hitschmann and Adler's work to further proof, was to determine how inflammation (and we will limit ourselves throughout this paper to chronic inflammations because acute inflammations are readily recognized both clinically and microscopically) affected the normal cyclical changes, and whether true glandular hypertrophy and hyperplasia occurred without an inflammatory basis.

What follows is based upon a fairly extensive study of the literature, and upon considerable personal experience of comparison between clinical data with the curettings obtained. My personal views cannot, of course, be entirely eliminated, but I shall attempt to give an impartial statement.

The reports of many hundreds of cases show that plasma cells are absent in nearly two-thirds of the cases in which the clinical history would lead us to expect them to be present. This is readily explained by the fact, which is likewise true of other organs, that, although plasma cells are almost always found in the early stages of inflammation, they disappear long before other elements—particularly lymphocytes—are absorbed.

We are justified in accepting *the presence of plasma cells as evidence of a subacute or chronic endometritis*; their absence leaves the question of inflammation open. In only one-third of the cases, which clinically showed symptoms which we are wont to ascribe to endometritis, were plasma cells found.

Other investigators have claimed that the usual signs of chronic inflammation, recognized elsewhere in the body, can be utilized in diagnosing endometritis. These signs, as previously stated, are exudation, vessel and stroma changes. Personally I must acknowledge that I am unable to recognize them, for in the normal mucosæ of virgins and nulliparæ I constantly find pictures which I cannot distinguish from those described as inflammatory. Consequently, I consider it inadmissible *to conclude from such evidence* that certain forms of pathological glandular hyperplasia, to which it will be necessary to again refer, are due to chronic inflammatory stimuli.

On the other hand, we meet with many microscopical pictures in which the cyclical phase does not correspond to the actual time

relation to the patient's menstruation, as judged by the schema proposed by Hitschmann and Adler. We constantly encounter specimens showing "premenstrual" characters, though menstruation has barely ceased. Likewise, the curettings obtained from women during normal menstruation, cannot, as a rule, be differentiated from those taken from a patient suffering from menorrhagia and metrorrhagia. From this it would seem logical to conclude, that the cause of endometrial changes, whether they document themselves by glandular overactivity or by hemorrhage, are ovarian in origin, rather than inflammatory. Additional evidence is supplied by Buettner's statistics, in which he showed that in those cases in which inflammation surely existed (the curettings contained plasma cells) gland hyperplasia was less in evidence than in the ones in which no plasma cells were found.

In addition to pictures which, to a greater or lesser degree, conform to the cyclical phases, we encounter mucosæ which show such exaggerated hyperplasia or such distortion of the normal type, that we have hitherto habitually classified them according to their most striking features—fungoid or cystic "endometritis," hypertrophic mucosæ, even "simple adenoma."

Clinically such cases are commonest in very young girls at the onset of menstruation; at the approach of, or even after the onset of the climacterium; and in the presence of submucous myomata. Almost invariably the patients suffer from excessive menstruation and again the preponderance of evidence points to ovarian (functional) derangement, rather than to inflammation.

SUMMARY.

a. Hitschmann and Adler have shown that a majority of the changes hitherto classed as "chronic glandular or interstitial endometritis," are physiological and not inflammatory.

b. Further investigation has demonstrated that the presence of the plasma cell is an evidence of inflammation; their absence gives no assurance that inflammation has ceased.

c. The presence of plasma cells, in otherwise normal mucosæ, show that inflammation does not necessarily disturb the cycle or produce hyperplasia.

d. No definite proof can be adduced to show that gland hypertrophy or hyperplasia is caused by inflammatory stimuli.

e. Evidence substantiates the belief that gland hypertrophy and hyperplasia are often due to ovarian influences (functional).

f. Reduced to its simplest clinical terms, the foregoing shows:

1. That *anatomical* evidence of inflammation is demonstrable in less than 38 per cent. of all cases.
2. That many cases which anatomically show the presence of inflammation give no corresponding *clinical* symptoms.
3. That a majority of cases which show the conventional symptoms of "endometritis" (leukorrhea or bleeding) are wanting in demonstrable microscopic signs of inflammation.
4. That, therefore, in most cases, we are obliged to search for other etiological factors to account for the symptom-complex hitherto called "chronic endometritis."

This is as far as the present state of research, along these lines has brought us. It now behooves us to consider how these facts should influence us in our clinical activity.

It at once becomes evident that the term "chronic endometritis" has been grievously misused. The gynecologist has permitted himself to fall into the habit of barely scanning the report of curettings, handed to him by the pathologist, solely to discover whether any evidence of malignant disease was found—"endometritis"—was taken for granted!

In order to inaugurate a reform, the clinician will have to insist, in the first place, that the pathologist, who as a rule takes but a perfunctory interest in uterine curettings (aside from the possibility of carcinoma, chorioepithelioma or other tumors) take cognizance of our more recent knowledge; in the second place, he will be obliged to check in himself the pernicious and deep-rooted tendency to ascribe a great number of heterogeneous pelvic symptoms to inflammation of the endometrium.

Let us refer to only the most common symptom—bleeding, whether in the form of menorrhagia or metrorrhagia. Because it comes from the uterus, therefore the uterus must be at fault. Consequently we curet; only too often without avail. The "diseased" endometrium is removed, but the hemorrhages keep on. Chronic metritis, fibrosis uteri, menorrhagia myopathica, arteriosclerosis of the uterine vessels, etc., etc., each have had their day of popularity, but uteri with or without these changes continue to bleed. Remove the ovaries (do not mistake me; I do not advocate this measure!), and the hemorrhages cease. In other words, the cause of the bleeding is ovarian. We are now just on the threshold of an era in which *functional* uterine disturbances are beginning to be recognized, and as our knowledge increases, we will realize more and more that so-called "uterine"

symptoms such as atrophy (lactation or other), dysmenorrhea, sterility, subinvolution, menorrhagia and metrorrhagia are due, in the majority of instances to functional disturbances of the ovary. This realization is the first step, the next will be to discover for each group the *ovarian* cause, and the final progress will be marked by a rational therapy.

983 PARK AVENUE.

DECIDUA FORMATION IN THE OMENTUM IN SECOND-ARY ABDOMINAL PREGNANCY.

BY

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(With three illustrations.)

THE occurrence on or just under the peritoneum of the pelvis, especially that lining Douglas' pouch, of little tubercle-like prominences, consisting microscopically of large, pale, roundish cells with one or more nuclei, and having all the histologic characteristics of uterine decidua, as a fairly frequent, if not indeed a constant accompaniment of pregnancy, has come to be fairly well recognized. When this decidual reaction of the abdominal serosa was first described by Walker in 1887 he believed it to occur only in connection with abdominal pregnancy, as in the two cases in which he observed the phenomenon the developing embryo was found attached to the parietal peritoneum in Douglas' pouch. A few years later, however, Dobbert demonstrated the presence of entirely similar nodules in the peritoneum in a case of tubal gestation, and therefore disagreed with Walker as to their occurrence only in connection with abdominal pregnancy, but believed that they could be produced by *any* form of ectopic implantation of the ovum. In 1895, however, Pels-Leusden reported a case in which a group of cells corresponding in every way to those described by Walker was found in the Douglas' pouch of a woman who had died from eclampsia a few hours after the termination of a normal *intrauterine* pregnancy, and Schmorl a couple of years later went still further, showing that the formation of these decidua-like cells in the peritoneum not only does occur in intrauterine pregnancy, but that it is in fact an almost constant accompaniment of that condition, reporting thirty cases of normal pregnancy in which these little nodules were found on the pelvic serosa. He showed that they occur not

only just beneath the surface, but also in the deeper layers of the peritoneum or subperitoneal connective tissue, and almost equally constantly in the ovaries, where they may usually be found in the outer layers of the stroma, occasionally also in small groups deeper down in the neighborhood of small veins. This view as to the relative constancy of a more or less marked decidual reaction in the pelvic peritoneum has been confirmed by other investigators, notably by Kinoshita and Stravoskiadis, the former of whom found decidual cells in the peritoneum in all but one of eleven autopsies performed on women who had died during pregnancy, and the latter in all but three of eighteen similar cases. Lange also in studying fifty such cases found the condition in all but four. These cells occur with the greatest frequency in the peritoneum covering the posterior surface of the uterus and the anterior wall of the rectum, but also to a less extent in practically all portions of the pelvis and lower abdomen, as for instance on the anterior surface of the uterus, the posterior wall and fundus of the bladder, the broad ligaments, the surface of the tubes, the serous coat of the intestines, etc., and they have been reported at least once each in the appendix (Hirschberg) and in a parovarian cyst (Taussig), in both of which latter cases they occurred in connection with tubal pregnancy. That the transformation of some of the stroma cells of the ovary into large decidua-like cells occurs during a large percentage of both intra- and extrauterine pregnancies has been shown by Schmorl, Schnell, Lindenthal, and others, and has now come to be a well recognized fact. An unusual seat of extrauterine decidua formation has recently been reported by Freund, who found small nodules of decidua-like cells in the vagina of a woman who died of septic abortion when three months pregnant.

The so-called "decidual reaction" consists briefly in the transformation of connective-tissue elements into large, pale, more or less roundish or polygonal cells, usually containing numbers of small, clear vacuoles, these probably being due to the heaping up of glycogen; the nucleus is round, regular, considerably larger than that of the unaltered connective-tissue cell, and takes a correspondingly less intense stain. Frequently cells containing two, three, or occasionally even more nuclei are seen. These large, very characteristic cells lie quite close together, separated however by a delicate framework of intercellular substance consisting of connective-tissue fibrils. Scattered throughout this intercellular tissue are found smaller cells, having a finely granular,

dark protoplasm and deeply staining nucleus. These Marchand believes to be merely representatives of the connective-tissue cells which have not undergone the decidual transformation, as all intermediate stages between them and the fully developed decidua cells are to be found. The older theories that leukocytes, epithelial, or endothelial cells take part in the formation of a decidua have now been practically given up, as it has been repeatedly shown that only cells of a connective-tissue stroma are capable of undergoing this reaction, whether its site be the endometrium, where of course it reaches its fullest and most perfect development, or any of the other situations where it has been observed.

The chief quality requisite for the formation of decidual cells by any connective-tissue when acted upon by the necessary stimulus appears to be that it be soft and easily capable of expansion, conditions which are fulfilled by no tissue better than by that of the omentum. In view therefore of the widespread tendency possessed, as has been shown, by connective-tissue cells in various portions of the abdomen and pelvis to undergo a decidual reaction, and considering the frequency with which the omentum becomes involved to a greater or less extent in cases of ruptured tubal pregnancy, especially in those cases where the ovum has formed a secondary attachment in the abdomen, it would seem rational to suppose that the formation of decidual cells in the omentum would be a matter of rather frequent occurrence, and yet reports of this condition are exceedingly rare. The literature of tubal and abdominal pregnancy—by the latter term being understood of course cases of secondary as well as of so-called “primary” abdominal pregnancy—has grown to such enormous proportions that to look up every reported case would be a tremendous undertaking, if not a practical impossibility, and no attempt has been made to carry this out. While therefore it is possible that scattered cases exist in the literature where decidua formation in the omentum was a part of the histologic picture a fairly extensive search has brought to light at most six or seven examples of this condition, and on the other hand in several instances where it might especially have been expected it was absent, notably in Witthauer’s case of a very young ovum found developing embedded in a tag of omentum, which he considered one of true primary abdominal pregnancy. Although careful histologic studies of the omental tissue were made in this case no semblance of a decidual reaction was found.

Probably the first to report decidual reaction in the omentum

was Prochownik, who in 1899 demonstrated a case of tubal pregnancy in which tubal abortion had taken place and the embryo had been extruded into the abdomen. This had occurred seven months previous to the operation, at which the chief component of the fetal sac was found to be the omentum, scattered extensively throughout which were large numbers of characteristic clumps and nests of decidual cells. In 1902 Schmorl made the rather remarkable statement that in three cases of intrauterine pregnancy, in which no adhesions existed between the uterus and the omentum, he had found in the latter organ clumps of decidual tissue, these occurring either as little whitish, pedunculated nodules the size of a pin-head attached to the under surface, or as little grayish, translucent plaques. In the same year Lange reported a case, also of intrauterine pregnancy, in which groups of characteristic decidual cells were found just beneath the serosa in small multiple fibromata of the omentum. The most carefully studied case of omental decidua is that of Penkert, published in 1905. His patient was a twenty-three year-old woman who died shortly after an operation for ectopic pregnancy. At the operation a ruptured tubal sac the size of a man's fist, containing a living three months' fetus, was removed. Examination of the specimen showed the presence of bits of tube with adherent pieces of omentum, to which latter were attached chorionic villi. The uterine end of the tube was unchanged, and the case was evidently one in which after rupture of the tubal sac the ovum had sought new attachments to the omentum. In the latter, groups of typical round or ovoid decidual cells were found lying among the fat tissue. These cells had no apparent relation to the larger vessels of the omentum, nor to endothelium, but could be demonstrated as arising from cells of the fat tissue. In this case a direct connection between chorionic villi and omental tissue could be demonstrated in places. Penkert believed that the development of a decidua was dependent upon the presence of a living fetus, and he subsequently examined a series of eight cases of extrauterine pregnancy in which the omentum was adherent to the sac, but in which at operation either a macerated fetus or none at all was found, and in all of these was unable to discover any traces of a decidual reaction in the omentum. Finally, Taussig reports a case of pregnancy occurring primarily in the fimbria of the tube, but which had become secondarily abdominal, associated with a large parovarian cyst. In this case "adhesions to the posterior surface of the uterus at several points, as well as

between the uterus and the left tube, contained nests of decidual cells. Some of the latter adhesions contained fatty tissue, so that it is not unlikely that they represent bits of adherent omentum. At the time of operation the omentum was found adherent to the uterus, but no especial attention was paid to the site of these adhesions." Whether or not this case should really be considered as one showing decidual reaction in the omentum seems rather doubtful.

In view therefore of the relative infrequency of this condition the publication of the following case may be of interest. The patient was operated upon at the Preston Retreat, Philadelphia, by Drs. R. C. Norris and E. P. Barnard, to whom I am indebted for the clinical notes and for the use of the material.* The clinical history is, very briefly, that the twenty-year-old patient had some severe attacks of abdominal pain when about three or four months pregnant, which in view of the later findings are probably to be interpreted as having accompanied a tubal abortion at that time. She recovered from these, and was admitted to the hospital when supposedly somewhat past term, believing herself to be normally pregnant. Fetal movements and heart sounds were easily elicited. On examination, however, the uterus was found to be small and pushed over to one side, and a large mass could be palpated in the abdomen. The condition was recognized as one of abdominal pregnancy at or past term, and a laparotomy performed after the patient had been in the hospital about two days. During this time, however, the child had died, and at operation the full-term, dead fetus, with the placenta, was found lying free between the coils of intestines. Dr. Norris says that there were practically no adhesions anywhere, and that it was a simple matter to remove the child and placenta, the latter being attached only at one uterine cornu, where he placed a ligature, removing the tube and ovary of that side with the placenta. The operation consumed but a few minutes; the patient had a normal convalescence, and left the hospital in good health.

Pathologic Description of Specimen.†—This consists of the placenta, which had lain in formalin for about a year previous to the examination. It consists in the main part of several more or less globular masses, two of which are considerably larger than the

*A brief report of this case, from the obstetric standpoint, will be published elsewhere by Dr. Barnard.

† Demonstrated before the Pathological Society of Philadelphia, October 12, 1911.

others, and reach the size of oranges. These masses lie closely packed together, the smaller springing to a certain extent from the surface of the larger. At least three-fourths of the surface area of these masses corresponds to the fetal side of the placenta, and is here for the most part dark bluish-purple in color, varied in some of the smaller nodules by yellowish to whitish areas; it is covered by a thin, smooth, shiny membrane, directly under which lie numerous large ramifications of the umbilical vessels. Attached to these nodular masses of placental tissue is a much more flattened out sheet of tissue, varying in thickness from 3 mm. to 1 cm., covered likewise on the fetal surface with the smooth amniotic membrane. On the maternal surface, however, the greater portion is very rough and irregular, mottled in appearance, and makes the impression of having been torn loose, or of having spontaneously separated from some other structure. Near the attachment of this sheet-like portion of the placenta to the nodular portion, however, the maternal side presents likewise a fairly smooth surface, yellowish-white in color, giving the impression of a musculo-fibrous structure, which also extends over a part of the largest of the nodular masses, the remainder of which are entirely covered by fetal structures. Around the entire edge of this sheet-like portion of the placenta, and extending across the nodular masses in a line which separates the fetal from the maternal structures described above, are the thin, delicate membranes, ruptured of course, but still showing distinctly the whole line of attachment.

Attached to the maternal surface of the nodular portion of the placenta is a pedicle, consisting of two layers of dense fibrous tissue between which, surrounded by looser connective tissue, are the cut ends of many large blood-vessels. This is where the ligatures were placed, and was the only point at which any cutting was necessary in removing the placenta. It seems probable that it was through these vessels that the placenta received the major portion of its maternal blood supply. Immediately contiguous to this pedicle are the tube and ovary, the former 7 cm. long, entirely free at its outer end, which is patulous and shows well developed fimbria. The uterine end of the tube disappears entirely in the placental mass. The tube is not thickened at all, and but for the presence of some exudate on the surface appears normal. The ovary is small, much flattened out, and shows on the surface a few small cystic follicles and also bits of plastic exudate.

Microscopic sections taken from the nodular masses comprising the main portion of the placenta show for the most part closely-packed chorionic villi with a single-layered epithelium (syncytium), which is well preserved, but shows very little tendency to form the buds or outgrowths so frequently seen. There is nowhere any evidence of edema of the villi. In some areas the villi instead of lying close together, are quite widely separated, the intervillous spaces being here filled with masses of red blood cells. Here and there are large septa of rather loose connective-tissue which contain engorged blood-vessels and show in many places marked leukocytic infiltration, and usually lying in the neighborhood of these septa are masses of trophoblast. Definite decidua cells cannot be demonstrated in this portion of the placenta. In many quite extensive areas the entire tissue has undergone necrosis, the villi taking on a more or less homogenous, pinkish stain in hematoxylin-eosin preparations, lying matted together and embedded in masses of fibrin, and being recognizable merely from their general form. In these necrotic regions, which present all the typical features of the so-called "white infarcts" of the placenta, are very numerous areas of calcification; these are also to be found, but to a much less marked degree, in the nonnecrotic portion of the tissue as well.

Sections taken from the more flattened-out portion of the placenta with the roughened maternal surface, referred to in the gross description, present a somewhat different picture. On the fetal surface is seen a fairly broad layer of moderately dense, not very cellular connective-tissue, easily recognizable as the chorionic membrane, although the amniotic epithelium is entirely lacking (macroscopically the thin, shining amnion can be seen to have become completely separated from the other layers in this part of the placenta, and therefore does not appear in the microscopic sections). Beneath this somewhat thickened chorionic membrane is a fairly broad layer of trophoblast, characterized by large, irregular nuclei, very vacuolated protoplasm, more or less indistinct but still recognizable cell-boundaries, and fairly large areas of fibrinous degeneration in which all details of structure have given place to a finely fibrillar, pink-staining mass. Some of those fibrinous areas suggest by their form the possibility of their having originated from degenerated chorionic villi, but this cannot be determined with certainty. No normal villi are to be found anywhere in these sections.

Next to this trophoblast layer, and everywhere adherent to it,

is a layer of varying thickness in different sections, composed chiefly of loose connective tissue and fat, showing the presence of many engorged blood-vessels and much inflammatory infiltration in spots. This layer is not solid, but is broken up into a number of irregular strips and tags, on the surfaces of many of which a distinct layer of large flat endothelial cells can be seen. From the histologic appearance of this tissue (see Fig. 1), and from its occurrence on the maternal side of that portion of the placenta which must have come into

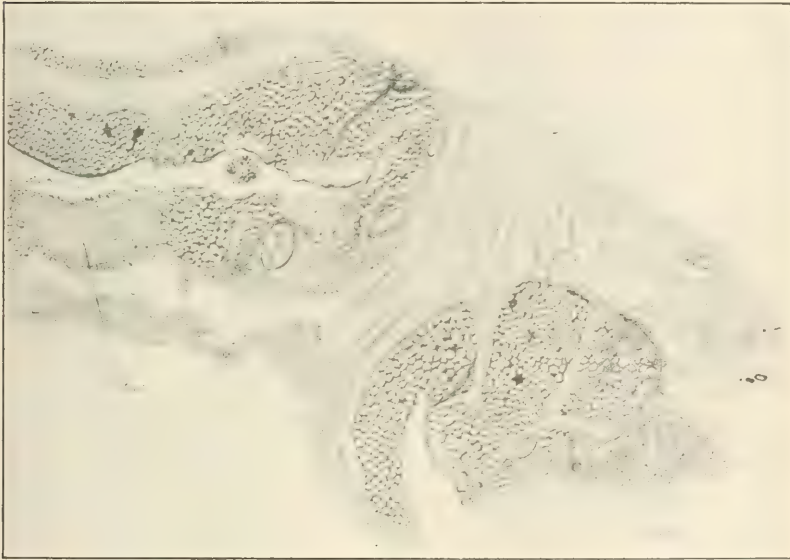


FIG. 1.

most direct relation with the intestines, its diagnosis as omentum can be made with certainty. The fat tissue is very abundant, and, except for the presence of a considerable amount of inflammation spoken of above, is entirely normal in appearance. Here and there scattered about throughout this fat tissue, however, are very clearly defined groups of most characteristic cells, entirely different from anything else in the specimen. These are roundish, ovoid, or polygonal elements, many times larger than the stroma cells of the surrounding connective tissue, having perfectly distinct cell-boundaries, and arranged in many places in a beautifully tessellated manner, somewhat remotely suggestive of squamous epithelium seen from the surface. Each cell has a

large, pink-staining, finely granular cell-body; the tendency to vacuolation is not marked, but can be demonstrated in occasional cells. The nuclei are regular in form, round or oval, very distinct, and show with the high power a fine chromatin network. Cells containing more than one nucleus are quite common. Between these large cells are scattered in most instances many smaller ones, resembling in every respect ordinary connective-tissue cells. The large cells are separated from each other by varying amounts of connective tissue, which stains intensely red by the van Giesse method; here and there are to be found small capillary blood-vessels, though the presence of the latter in these cell clumps



FIG. 2.

is by no means a constant feature. These groups of cells are to be found in the greatest profusion throughout all the sections taken from this portion of the tissue; they occur for the most part in the fat tissue itself, and in many places seem to have entirely replaced this, in others they immediately adjoin areas of fat, or are completely surrounded by the latter. They also occur in regions where the stroma is composed of loose connective-tissue but no fat is present. In some cases they can be seen lying distinctly under the surface endothelium, but in no place do they give the slightest impression of having arisen from this, whereas on the other hand various intermediate stages between these cells

and those of the fat tissue can be seen. From the close coincidence in appearance between these groups of cells and intra-uterine decidua it is clear that we are dealing here with a decidual change of the stroma cells of the omentum brought about by the pregnancy, this portion of that organ having become attached to the fetal chorion and been separated from the rest of the omentum very probably at the time of the death of the fetus, as a result of the inflammatory changes already noted.

Figs. 1, 2, and 3 show the general appearance of the conditions just described under different degrees of magnification. Fig. 1, drawn under extremely low power, shows the general relations of

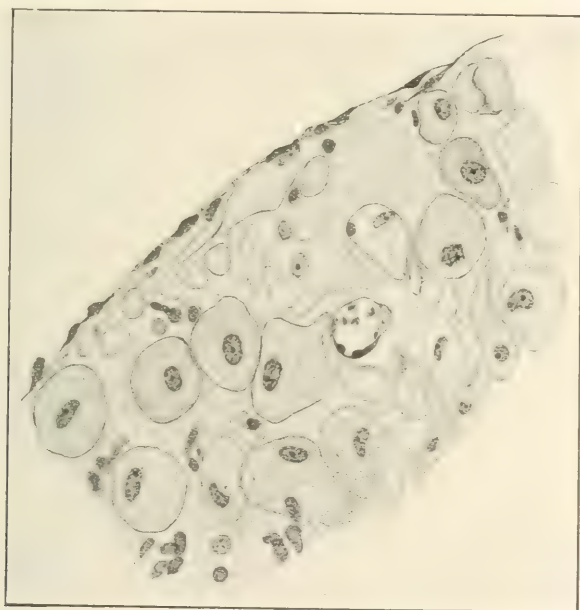


FIG. 3.

the cell-clumps to the omental tissue; in many places they occur with much greater frequency than in this particular field, however. Fig. 2 is drawn with the $\frac{2}{3}$ inch objective, and shows a group of the decidua cells lying near the edge of a tag of omentum, which contains much fat tissue and considerable inflammatory infiltration, the latter having entirely supplanted the surface endothelium. Fig. 3 gives merely a small portion of one of the cell-clumps under the high power, showing the form and general relations of the individual cells, the intercellular fibrous stroma with small connective-tissue cells, and on the surface a distinct lining of

endothelium. In two or three of the large cells vacuolation can be seen; here and there are cells which have lost their nuclei and their sharpness of outline, and are apparently undergoing degeneration. Near the center of the field is a capillary blood-vessel containing a few leukocytes. Many intermediate types between the small connective-tissue cells and the large, fully developed, decidua-like ones are to be seen.

Sections taken from the tube at several points show an intense interstitial salpingitis, which is confined chiefly to the outer layers. The mucosa appears to be but slightly affected, and no evidences of pregnancy are to be seen in the sections examined. Sections from the ovary show the presence of a large, well developed corpus luteum containing numerous small areas of calcification. In the outer layers of the ovarian stroma, forming almost a complete ring about the organ, are extensive masses of decidual cells. In places these can be seen to be covered with intact germinal epithelium; for the most part, however, this has given place to small bits of inflammatory exudate which are adherent to the surface of the ovary.

The question as to the etiology of the decidual masses in the omentum is of extreme interest. It can hardly be maintained that the decidua has been formed here in a physiologic sense, *i.e.*, in order to give to the ovum opportunities for attachment and nourishment. No chorionic villi were found in direct attachment to this omental decidua, at least none sufficiently well preserved to be definitely diagnosed as such, and the history of the case indicates that the pregnancy was primarily tubal at any rate, the ovum reaching its final resting place in the abdominal cavity only after it had undergone several months of development; the attachments which it then formed to the omentum must therefore be considered purely secondary in character. Just what influence the presence of the developing ovum in immediate proximity to the omentum and ovary had in producing the extremely extensive decidual reaction in those structures is hard to state, though that this factor must have played a certain rôle seems clear. Loeb's interesting experiments have shown—at least for rabbits and guinea-pigs—that the primary factor in the formation of *uterine* decidua is the presence in the circulating body-fluids of a hormone developed in the corpora lutea; that the uterine mucosa, being "sensitized" by the presence of this substance, will respond by the formation of a decidua to any non-specific irritation—such as deep incisions into

the uterine wall, the introduction of bits of glass tubing or other foreign substances into the uterine cavity—even though the ovum be entirely excluded from entrance into the uterus by ligation of both tubes. If this theory, that the sensitizing influence arises in the ovary, and not in the developing ovum, is correct, the seat of the fetal attachment would appear to exert no influence whatever on the formation of decidual cells except by acting as a mere mechanical irritation to the fixed connective-tissue cells of that region. Just how far this theory applies to the formation of extrauterine decidua cannot be stated; Loeb has not been able in his experiments to produce decidua outside the uterus, but the practically physiologic development of decidual nodules in the peritoneum and ovaries in normal pregnancies would seem to indicate that it may, in part at least, hold true for these situations as well. If the sensitizing hormone is the essential factor, and this arises in the corpus luteum, it would be natural to expect to find the ovarian stroma, at least that of the ovary containing the corpus luteum, and upon which its secretion must work in its fullest concentration, the seat of extensive decidual change. The fact that this change has been comparatively seldom observed in the omentum, however, would seem to indicate that under ordinary circumstances that organ either does not come extensively under the influence of the ovarian hormone, or that if it does come under this influence mechanical stimuli are wanting to call forth a decidual reaction. In such a case as the one at present under consideration, where considerable portions of omental tissue have come into closest relationship both with the developing ovum and with the ovary containing the corpus luteum graviditatis, both these factors must certainly have been favored to the fullest degree, and this would seem to offer a satisfactory explanation for the extensive formation of omental decidua.

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TRANSPOSITION OF THE UTERUS AND BLADDER IN THE TREATMENT OF EXTENSIVE CYSTOCELE AND UTERINE PROLAPSE.*

A FURTHER CONSIDERATION OF THE SUBJECT.

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(With twelve illustrations.)

The objects of this paper are:

- I. To point out the chief lesions of cystocele and uterine prolapse and the mechanical principles underlying their repair.
- II. To direct attention to some of the more important steps in the operation.
- III. To fairly apportion the credit due various men in devising, developing and popularizing the operation.
- IV. To discuss the results obtained by others.
- V. To consider the author's personal experience with especial reference to complications and incomplete cures.

THE word "transposition" is used in preference to "interposition" because it expresses more clearly than does "interposition," the essential features of the operation under consideration. "Interposition" suggests a change in the position of the uterus only. There is, however, a change in the position of both uterus and bladder, the altered position of the bladder being the more important feature.

I. Cystocele is hernia of the bladder through the vesicovaginal septum and is generally the result of injury at child-birth with subinvolution. The protrusion of the bladder and the senile changes in the tissues which occur after the menopause gradually increase the size of the hernia. The hernial opening, in extensive cases of cystocele, extends sagittally from the pubes to the cervix and transversely across the entire anterior portion of the pelvis. The anterior vaginal wall is usually so much thinned by stretching and laceration that no definite borders of the hernial opening can be palpated. A urethrocele with thickening of the mucous membrane over the body of the urethra is often coexistent.

* The most recent previous reports by the author: 1906, *Surg., Gyn. and Obst.*, ii, 654; 1909, *Surg., Gyn. and Obst.*, viii, 471.

Uterine prolapse is hernia of the uterus. In prolapse of the uterus the broad and uterosacral ligaments are elongated, the vaginal canal dilated, the perineum relaxed and usually lacerated. The cervix and the body of the uterus are frequently enlarged from passive congestion, edema and hyperplasia. The cervix

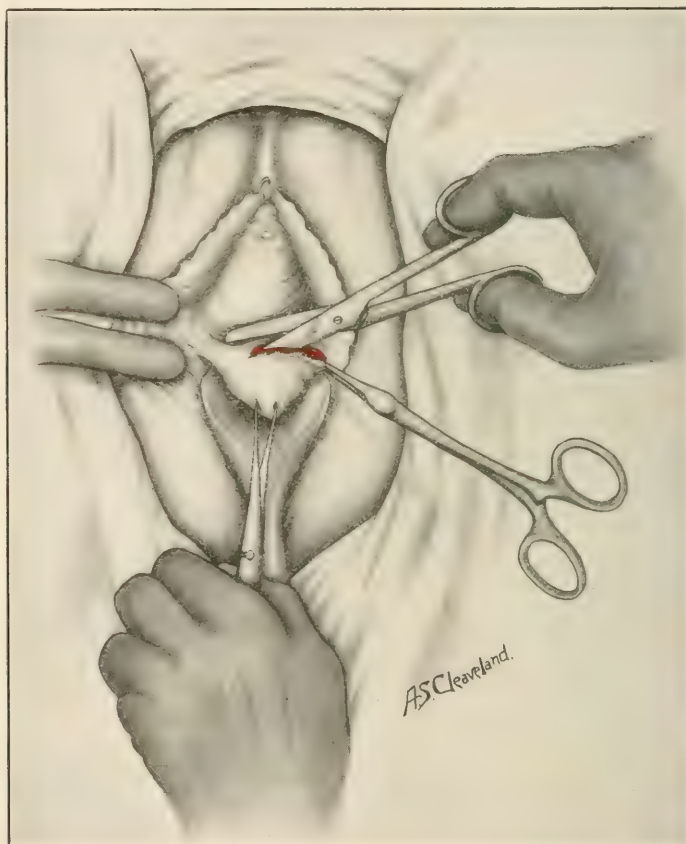


FIG. 1.—A transverse incision is made across the vagina at the junction of the anterior vaginal wall and cervix.

may be cystic and eroded as a result of lacerations, infections and friction.

A cure of the cystocele necessitates firm closure of the hernial opening through which the bladder protrudes. This is accomplished by interposition of the body of the uterus.

A chief factor in the cure of the uterine prolapse consists in twisting the broad ligaments, thus very much diminishing their

length. This rotation places the fundus anteriorly near the pubes and tilts the cervix up into the hollow of the sacrum. When the large prolapsed uterus is forward beneath the bladder the congestion and edema soon disappear, atrophy takes place and the uterus is thus much decreased in weight. These are important factors in affording permanent relief.

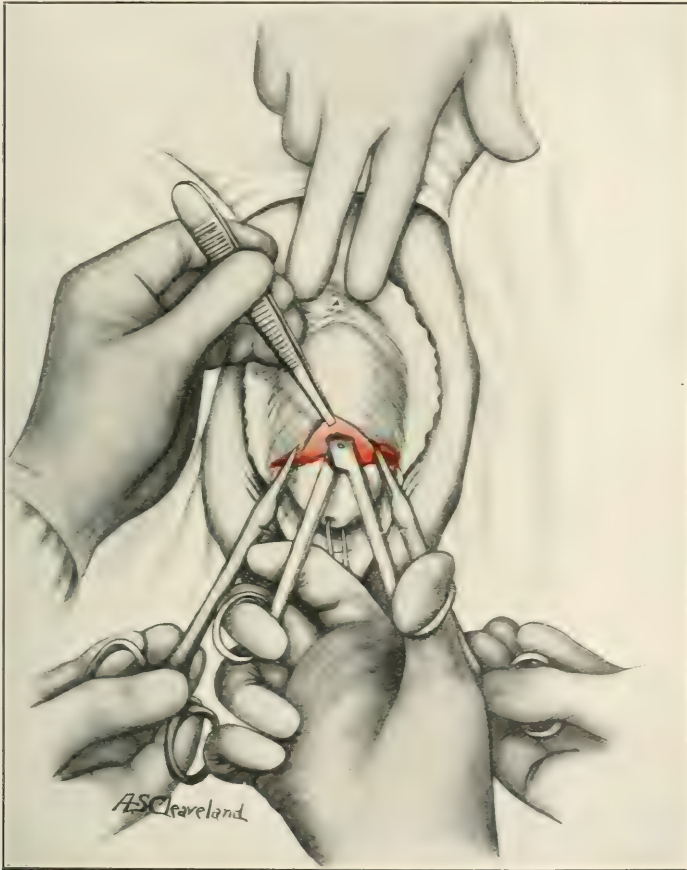


FIG. 2.—Care is used in inserting the scissors to keep the points pressed against the vaginal wall.

II. Since the author's technic has appeared in detail in former publications some of the more important features only will be discussed at this time.

A. Separation of the vaginal wall from the bladder (Fig 2).

This can be done with entire safety by blunt dissection with the scissors if the points of the scissors are kept continually in con-

tact with the anterior vaginal wall. The width of separation of the handles of the scissors is determined by the amount of resistance encountered and by the size of the cystocele. In starting the blunt dissection care should be taken to strike the plane of fascia, which is suprisingly distinct between the bladder and vaginal wall. Thus blood-vessels are not injured, dissection is



FIG. 3.—With gauze over the finger further separation of the vaginal wall from the bladder may be easily accomplished.

facilitated, and wound secretion is minimized. Experience has induced me to make the amount of separation less than formerly as a wide separation sometimes causes complications and is not essential to success.

B. Separation of the bladder from the uterus.

This is also safely done with scissors. Care is used to find the

plane of fascia between the bladder and cervix which is as distinct as that between the bladder and vagina (Fig. 4). In this dissection the points of the scissors are kept continually pressed against the cervix. Final separation is made with the finger when necessary.

C. Incision of the peritoneum.

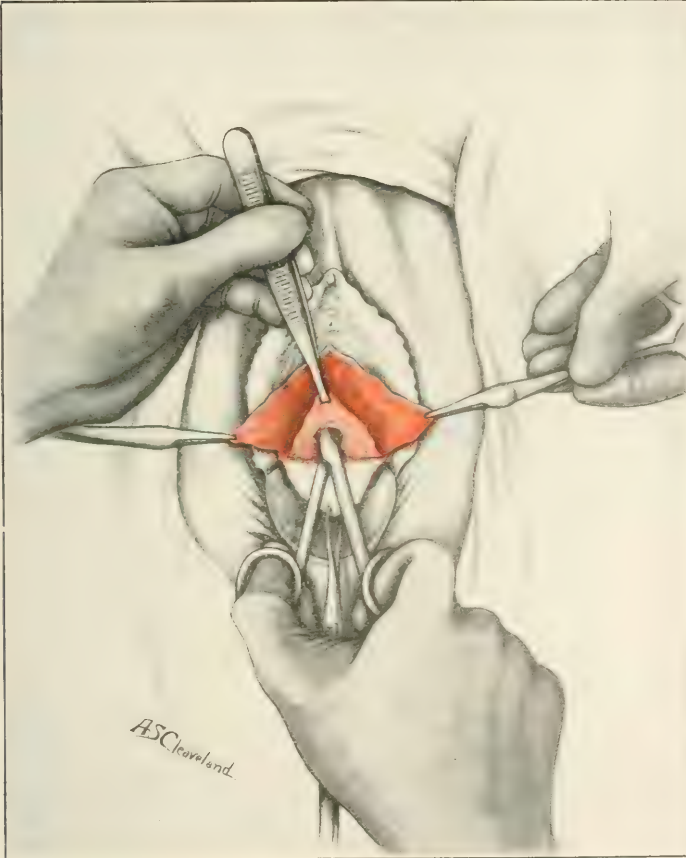


FIG. 4.—The plane of fascia is usually as distinct here as it is between the bladder and vaginal wall.

A long narrow retractor is placed in such a manner that the bladder is displaced forward and the anterior uterine wall covered by peritoneum is exposed. The peritoneum is now easily picked up with tissue forceps and incised.

D. The suture.

One continuous chromicized catgut suture fastens the uterus to

the vaginal wall and closes the vaginal incision (Fig. 9). The fundus of the uterus should be sutured near enough to the urethra to make impossible a parital recurrence of the cystocele (Fig. 8). Any noticeable hypertrophy of the vaginal mucous membrane over the body of the urethra should be excised before the suture is introduced. Otherwise it will protrude on standing and produce

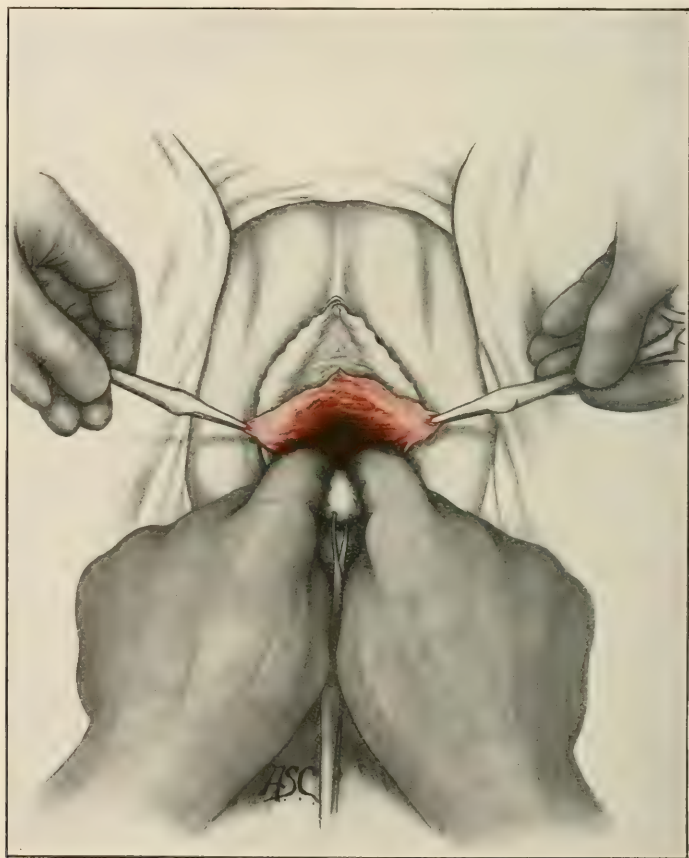


FIG. 5.—The amount of separation should be enough to permit the delivery of the body of the uterus.

some distress. If a urethrocele is present the suture should be passed through the vaginal flap so that when tied it will draw the urethra up into its normal location. In cases of very large cystocele some of the redundant tissue is excised but enough is left to insure broad surfaces for approximation. Continuing backward with the suture the wound made by the original trans-

verse incision is at times closed sagittally to lengthen the vagina and displace the cervix further backward and upward.

The operation is completed by making thorough repair of the posterior vaginal wall and is accomplished with a modified Hegar or Emmet perineorrhaphy.

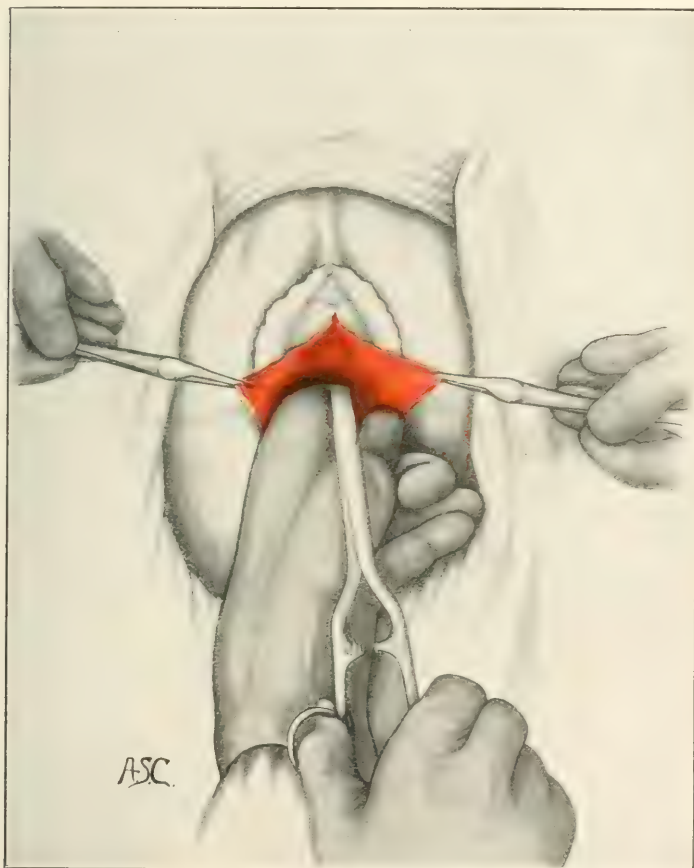


FIG. 6.—The anterior uterine wall is grasped with a single volsellum forceps inserted under the guidance and protection of the index-finger.

Figure 11 of the completed operation shows quite accurately the relative positions of the bladder, uterus, vagina and perineum. A surprisingly small amount of bulging of the anterior vaginal wall results. Conjoined palpation impresses one that the uterus is left but little more anteverted and flexed than is often the case in a normal individual. On cystoscopic examination the posterior wall of the bladder shows some convexity over the region of the interposed body of the uterus.

Modifications of the operation which may be required are the following:

1. Excision of the isthmic portion of the tubes (Fig. 12). This operation is done in exceptional cases during the child-bearing period. This operation is we believe not often indicated. The

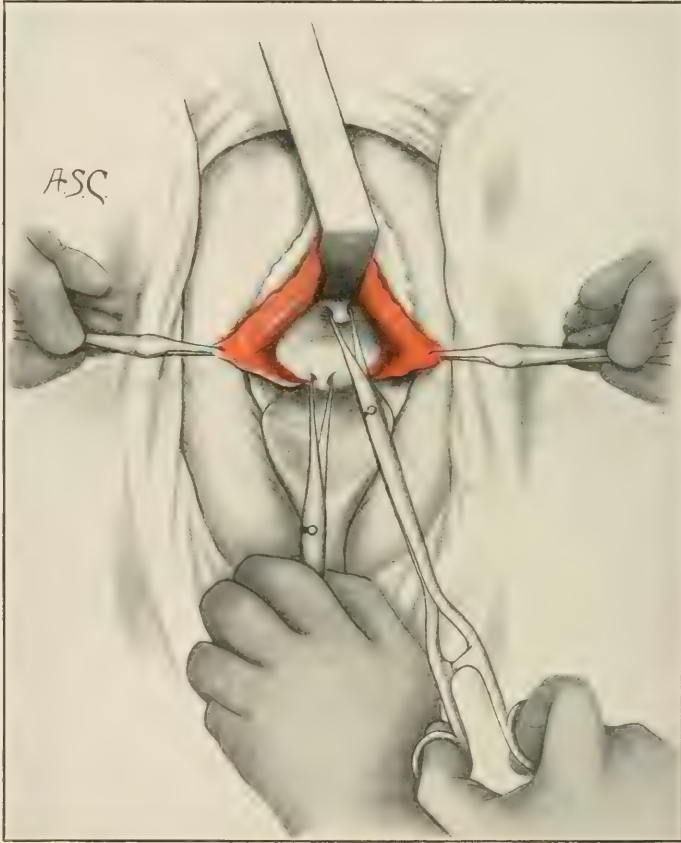


FIG. 7.—One should use care not to attempt delivery of the anterior surface of the uterus as the diameters of this are much greater than are the diameters of the fundus uteri.

displacements during the reproduction period are seldom too extensive to be repaired by procedures which do not interfere with gestation or labor, such as anterior colporrhaphy, advancement of the anterior vaginal wall or vaginal fixation of the round ligaments.

2. Excision of a portion of the uterus.

The technic of this is given in the writer's last publication

(1909). The amount of tissue removed varies in different instances. In some cases there is left only enough of the uterus to occlude the hernial opening. The operation is facilitated by excision of the entire endometrium when much repair work upon the cervix is required. This simplifies the technic and eliminates

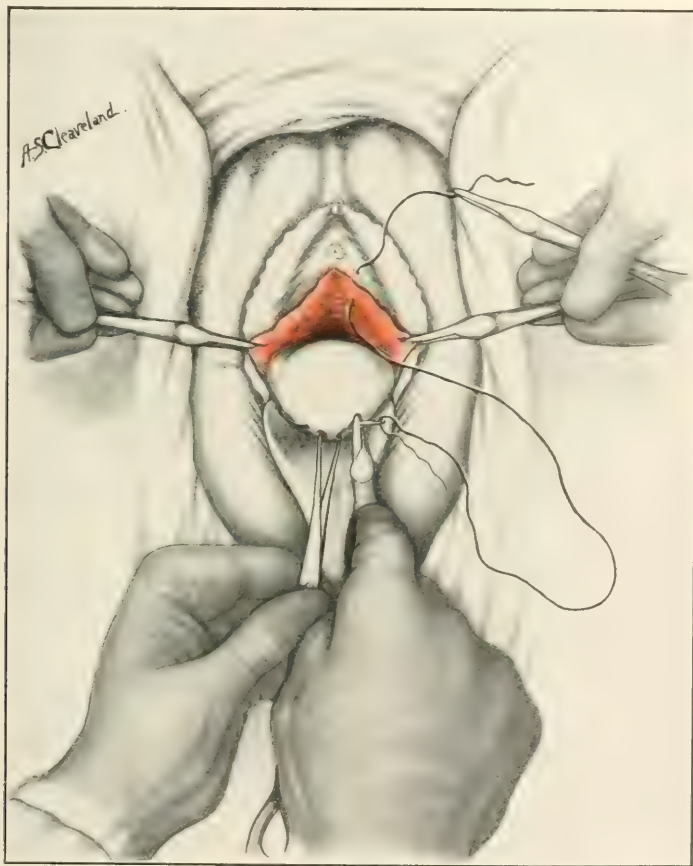


FIG. 8.—Care should be exercised not to fix the uterus so that it will press upon the urethra—but it should be brought down sufficiently to prevent a possibility of a portion of the bladder herniating between the fundus and pubes.

the danger of a resultant stenosis of the cervix. This operation is occasionally made when the uterus is so large and the broad ligaments so elongated as to endanger recurrence of the uterine prolapse.*

*The modified operation of severing the broad ligaments from the cervix and joining the cut ends in front of the cervix has been abandoned because of unsatisfactory results.

3. Occlusion of the entire uterine and vaginal canals. This includes excision of the anterior uterine wall and complete extirpation of the endometrium and vaginal mucosa. The vaginal canal is obliterated by a continuous suture. This is occasionally done in the very bad cases in elderly women when there is no objection to obliteration of the vaginal canal. This procedure is an extended LeFort operation and is I believe the only known procedure which is certain to prevent any recurrence of the uterine prolapse in some of the very extensive cases.

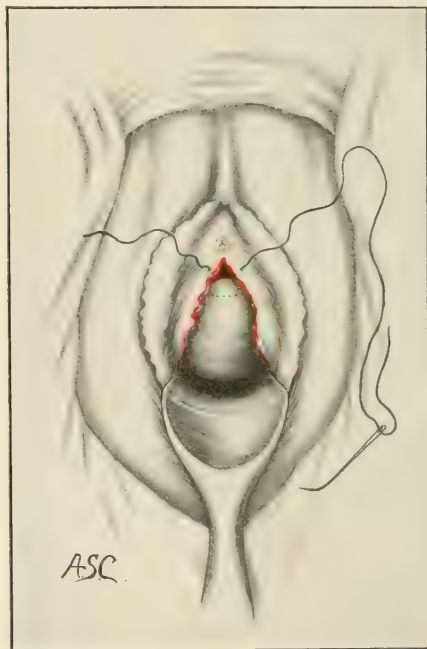


FIG. 9.—The uterine fixation is made and the vaginal opening is closed with one continuous catgut suture.

III. From an exhaustive study of the literature combined with personal observation and a considerable experience with this operation extending over a period of fourteen years, the writer wishes to summarize the accomplishments of those who have made the transposition operation a success.

Dührssen (1894) was the first to perform and to describe the operation of transposition of the uterus and bladder. He unfortunately included his description in a paper on "The Operative Cure of Immovable and Fixed Retroflexed Uterus." The

technic was so incorporated with numerous other vaginal operations in the treatment of 207 cases of retroflexion of the uterus that it failed to receive recognition until the operation was later independently described by other surgeons.

He evidently did not fully comprehend the value of his technic in the cure of cystocele and prolapse, and did not arouse any

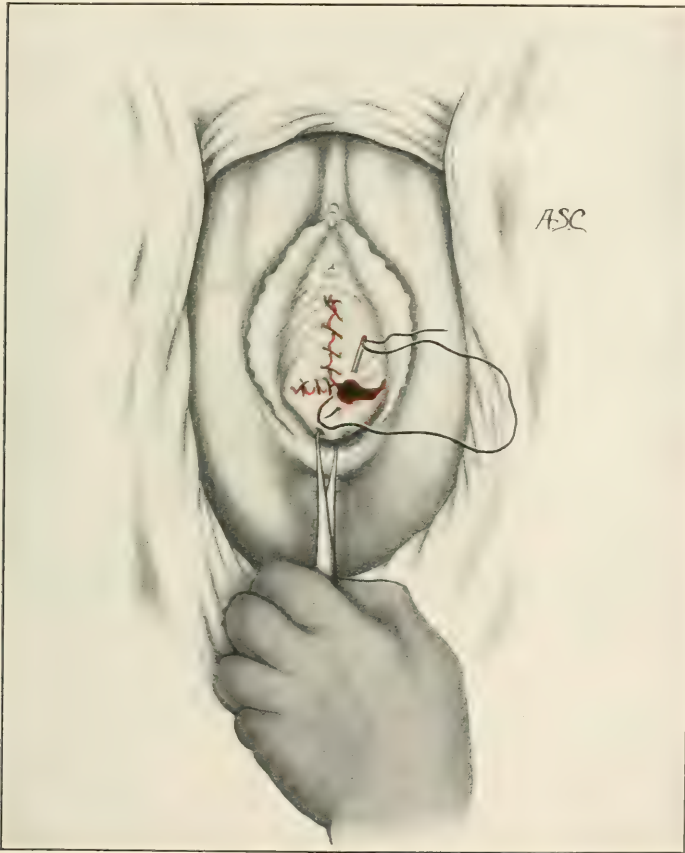


FIG. 10.—Experience has induced me to excise less of the vaginal wall than formerly and to include more of the vaginal wall in the suture so as to get broad surfaces of approximation.

considerable interest in the subject. Those who have since independently developed the same operation have more keenly appreciated its possibilities.

The work of Freund (1896) stimulated many to further work. He opened the peritoneal cavity through the posterior vaginal fornix, brought the uterine body down through the opening,

made a drainage hole through the fundus and sutured the uterus in its new position. The greater part of the uterus was thus left uncovered in the vaginal canal.

In January, 1898, the writer, independently developed and used for the first time the operation which he continues to employ at the present time. The results from three operations were published in 1899, and the advantages of the method then strongly urged.

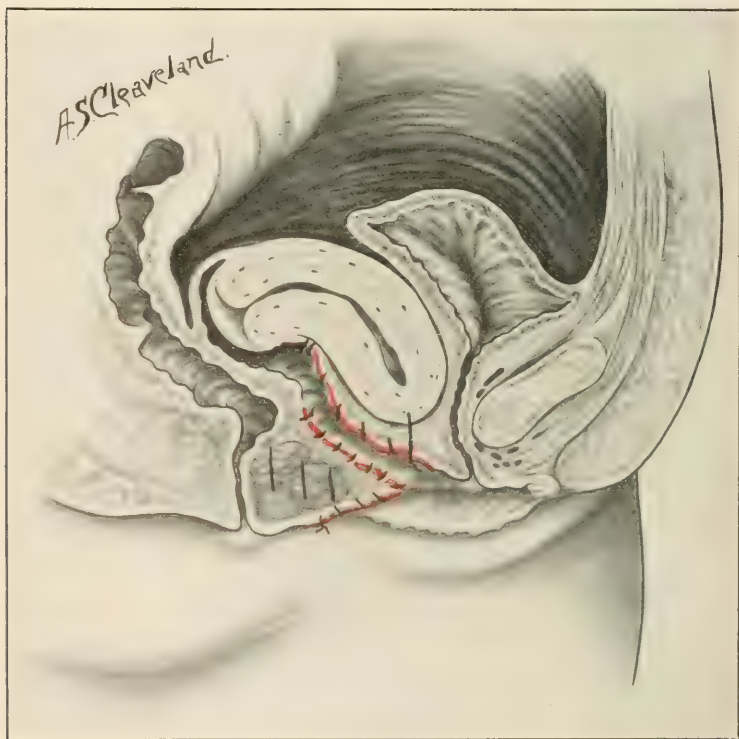


FIG. 11.—A sagittal section shows the relative positions of the bladder, uterus, and vagina and the location of the sutures with the operation completed.

Wertheim in 1899 independently used and recommended an operation based upon the same principles, differing only in that he at that time left a portion of uterine body exposed in the vaginal canal.

Stone (1899) developed an operation for uterine prolapse and cystocele and described it in part as follows: "The bladder is pretty widely separated from the uterus and broad ligaments and the edge of the incised vagina sutured to the anterior surface of

the uterus as high as the insertion of the round ligaments." He supplemented the operation by additional work performed through an abdominal incision.

Schauta (1909) claims much credit for closing the vaginal flaps over the uterus, and urges a modified technic whereby the bladder peritoneum is sutured to the peritoneum of the posterior surface

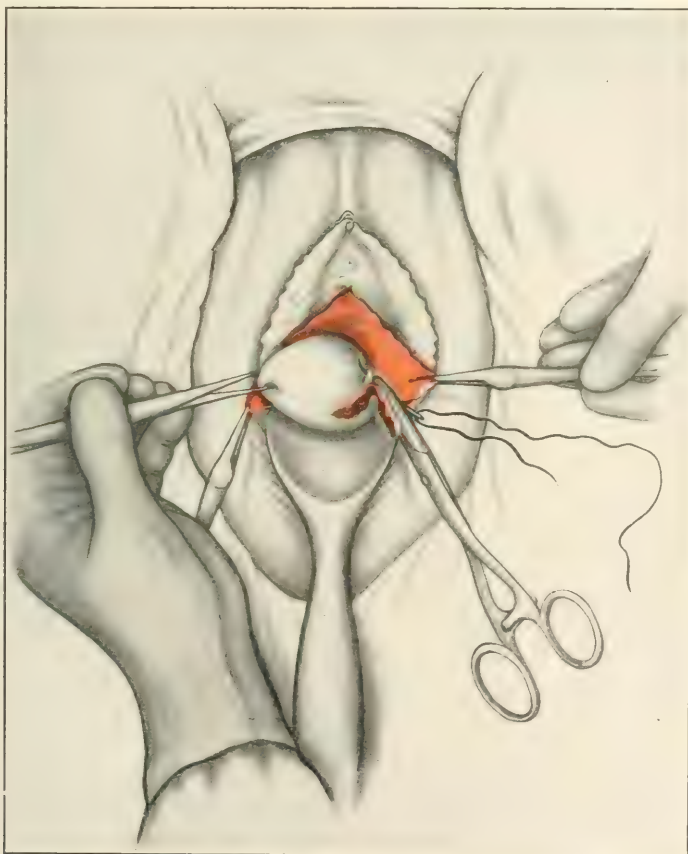


FIG. 12.—When indicated the isthmic portions of the tubes are excised.

of the uterus. The closure of the vagina over the uterus was included in my original technic eleven years before Schauta's publication. The suturing of the peritoneum is time-consuming, increases the dangers of infection and is unnecessary, as the peritoneum of the uterus and bladder remain in contact without suture. Schauta, however, deserves credit for recognizing the value of the transposition operation and for urging its use.

Fuchs (1909) in an able article reviews the results obtained by European operators who now employ the transposition operation and adds to our knowledge by relating his experiences and impressions. Others, notably Bucura (1901), Stone (1908), Violet (1909), Frankenthal (1909), Stoeckel (1910), Bröse (1910), and Bandler (1910) have added valuable experiences to the interesting literature of this subject.

IV. Results Obtained:

The following list is given with the understanding that it represents only in a crude way the results obtained by others who have employed this operation. The majority of operators obtain satisfactory results in from 80 per cent. to 90 per cent., although statistics derived from all available sources give a wider range in the number of permanent cures both above and below this percentage.

Operator	No. of operations	Year reported	Complete cures
Bucura.....	16	1902	93 per cent.
Bröse.....	44	1910	84.4 per cent.
Döderlein.....	47 (100 in 1909)	1907	71.8 per cent.
Fuchs.....	39	1909	97.4 per cent.
Frankenthal.....	100 (estimated)		
Gawriloff.....	45	1909	91.1 per cent.
Krönig.....	15	1910	67 per cent.
Löwit.....	113	1911	66.6 per cent.
Mayo.....	48 (100 in 1911)	1909	96 per cent.
Petri.....	11	1909	81.8 per cent.
Schauta.....	110	1909	77.9 per cent.
Scharpenack.....	100	1907	93 per cent.
Stoeckel.....	40		
Wertheim.....			

Remarks.—Stoeckel (1910) urges mobilization of the entire cystoceles by careful separation of the bladder laterally in addition to separation in the median line, and in so doing makes preliminary ligation of the vessels encountered when dividing the "bladder pillars."

Occasional injury to the bladder is reported. Quite likely this occurs more frequently than is stated, but is an uncommon accident in the experience of good operators.

Döderlein (operative gynecology), Scharpenack (1907), Fuchs (1909), and Schauta (1909) ascribe recurrence of greater or lesser degree to incomplete or poorly healed perineorrhaphy.

Scharpenack encountered recurrent small cystoceles between

the fundus and urethra due to fixation of the fundus in a faulty position.

Many, notably Landau, Fuchs and Löwit (1911), believe that excision of a wedge-shaped portion of the corpus or cervix in case of a large uterus or long cervix insures against a recurrent prolapse. Löwit in a series of thirteen wedge-shaped excisions encountered high fever in the first four and hemorrhage necessitating hysterectomy in one. Thereafter he inserted a gauze wick for drainage and the remaining eight patients ran a perfectly satisfactory afebrile course.

Postoperative hematomata, says Lichtenstein (1909), collect either in a space left between the uterus and bladder or between the uterus and anterior vaginal wall. These he avoids by fixation of the bladder to the uterus with many sutures, and by sutures anteriorly between the uterus and anterior vaginal wall with accompanying excision of the redundant vaginal tissue. Complications and unsatisfactory results are as a rule limited to the region of operation and exert but little harmful influence upon the general health of the patient. Fatalities have been recorded only in rare instances, mostly as the result of pulmonary embolism.

V. Personal experience, with special reference to complications and unsatisfactory results.

The author's experience with this operation dates from January 28, 1898. The number of cases operated are approximately 225. The hospital records prior to 1905 are not complete. I have private records of the patients operated during the last seven years and these (141 cases) are chiefly depended upon for a report at this time. Of the 141 cases eighty-nine had the usual operation performed. The following modified operations were performed: Myomectomies, nine; excision of parts of the Fallopian tubes, twelve; excision of portion of uterus, fourteen; operations for other complications, such as salpingitis, ovarian cysts, complete laceration of the perineum, etc., fifteen. There has occurred one death which resulted from pneumonia on the eighth day. Ten patients had postoperative fever of 101° to 102.4° for a period of from three to eight days. Of these one had an exudate in the culdesac following resection of the uterus, one developed catheter cystitis, two had pyosalpinx when operated, and in one pus was found in the paravaginal tissues at the time of operation. In the remaining five febrile cases the cause of the fever was in all probability due to retention of serosanguinous

fluid in the wound. This readily decomposes on account of the close proximity of the bacteria which are always found in the vaginal canal.

The cystocele has not to my knowledge recurred in a single instance. It is a mechanical impossibility for the cystocele to recur if the operation is properly performed. A cure of the cystocele is the important part of the operation because the extensive cases are usually found after the menopause at which time the bladder is the only actively functioning organ involved in the operation.

A few of the patients (probably 5 to 10 per cent.) have had some recurrence of the uterine prolapse. In three patients the fundus of the uterus protruded after a considerable interval. These patients were cured by excision of the protruding part of the uterus and suture of the wound. In one case, a small senile uterus, the cervix and body protruded parallel to the vulva.

Drs. Mayo report a similar recurrence in their practice. One would expect a larger number of recurrences of the uterine prolapse as these patients often have a general abdominal ptosis and it is impossible to repair the hernia of the uterus with mechanical precision without obliteration of the vaginal canal. Some recurrence of the uterine prolapse is not particularly disturbing, because excision of the protruding part and suture of the wound is easily done and gives good results.

A number of points learned by the writer as a result of difficulties encountered during operation and recurrences consequent to operation are deemed worthy of emphasis.

1. Blunt dissection with the scissors along easily found planes of fascia saves untold difficulties with hemorrhage. In earlier operations this dissection was needlessly extended far laterally between the bladder and uterus with the result that the ureters were endangered and considerable unnecessary bleeding occurred. The wide separation also predisposes to retention of wound secretion and infection. We therefore do not agree with Stoeckel that widely extensive division of the tissues between the bladder and uterus is desirable.

2. After the bladder is separated the insertion of a narrow, long retractor between the bladder and uterus allows a clear view of the peritoneum over the fundus. This can then be incised without danger of injury to the bladder or intestine. Without the assistance of the retractor this step in the operation is frequently difficult and dangerous. Injury to the bladder with

the scissors complicated two operations. In one of these a preceding inflammation made the injury unavoidable; in the other instance the technic was at fault. Closure of the torn bladder wall was easily accomplished by means of a purse-string catgut suture. Uneventful recoveries followed.

3. If the uterus is very large, the broad ligaments very long, the cervix much hypertrophied or eroded, an excision of a wedge-shaped portion of the anterior wall of the uterus or a high amputation of the cervix is essential to a good result.

4. The occurrence of hemorrhage with accumulation of blood either between the uterus and bladder or between the uterus and anterior vaginal wall, as encountered by Lichtenstein, need rarely occur if separation is made along fascial planes as described by means of blunt dissection with the scissors. Should there be any bleeding sutures placed deeply through the cervix on either side will include the vaginal branches of the uterine arteries and stop the hemorrhage.

5. Some elevation of temperature will occur in occasional cases as it is impossible to avoid some retention of wound secretion, contamination with vaginal bacteria and possibly colon bacilli. The use of a gauze drain we believe tends more to increase decomposition than to prevent retention of wound secretion. When fever occurs we have found that elevation of the head of the bed and the use of moist dressings over the vulva is soon followed by drainage of an offensive secretion and consequent normal temperature.

6. When the bladder and uterus are transposed the forces which tend to produce a recurrence of a prolapse of the two organs oppose each other. Any tendency to recurrence of prolapse of the bladder tips the uterus further forward, twists the broad ligaments more and thus elevates the uterus in the pelvis; any tendency to prolapse of the cervix elevates the body of the uterus and thus raises the bladder, which in its new position rests upon the posterior surface of the uterus.

NOTE—Much of the work on this paper was done by my associate Dr. A. H. Curtis.

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LARGE BILATERAL BARTHOLIN CYSTS.

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(With two illustrations.)

It is now generally recognized that cysts of the vulvovaginal gland are the sequel of long standing inflammation. In the course of the inflammatory process the duct becomes occluded and there ensues a gradual accumulation of a mixture of gland secretion and inflammatory exudate. As a rule the latter is gradually reabsorbed, leaving a more or less clear glairy cyst content.

Some authors have attempted to differentiate between cysts of the duct and cysts of the gland proper, but there does not seem to be any practical value or significance in such differentiation. At one time all inflammation of the Bartholin gland was considered to be due to the gonococcus, and therefore Bartholin cysts were looked upon as a late sequel of gonorrheal infection. Veit, in a recent publication, still maintains that this is almost invariably the case. Yet there are many cases on record in which the staphylococcus and the streptococcus have been the inciting agents. It is quite erroneous to assume that every Bartholin abscess is evidence of gonorrhea. The writer has been impressed with the frequency of the colon bacillus and repeated trauma as etiological factors, especially in young married women. Such abscesses contain the thick foul-smelling pus which one commonly encounters in acute appendicitis with abscess. The odor is not of itself of course distinctive evidence, as it is very easy for a mixed infection to occur in this locality.

As first described by Breton, the Bartholin cyst tends to remain small for long periods of time, and then to suddenly increase rapidly in size. Only then do they as a rule begin to attract the patient's attention. This increase in size may be due to hemorrhage into the cyst cavity, or to a fresh access of inflammation. The cysts are rarely larger than a plum and, curiously enough, are almost always unilateral. Thus Cullen reports seventeen cases; the smallest cyst was 5 mm. in diameter, the largest 4 cm. According to Kleinwaechter, "retention cysts

resulting from disease of the Bartholin gland are rarely larger than hen's eggs."

In 1886 Leopold reported a case of bilateral cysts the size of hen's eggs.

Very often the cysts do not cause any symptoms and are not even noticed by the patient; they are incidental finds to a routine local examination. It is only when they attain sufficient size to cause mechanical difficulty that they first attract the patient's attention. Dyspareunia is apt to be the first symptom.

Case Report.—M. E., æt. twenty-eight, Italian, married, admitted September 1, 1911, to Dr. Krug's service, Mt. Sinai hospital. Patient has three children, last child born seven months ago. Menstruation regular, duration three to four days, flow moderate. Last menstruation five months ago. Never had profuse vaginal discharge, or any dysuria or frequency.

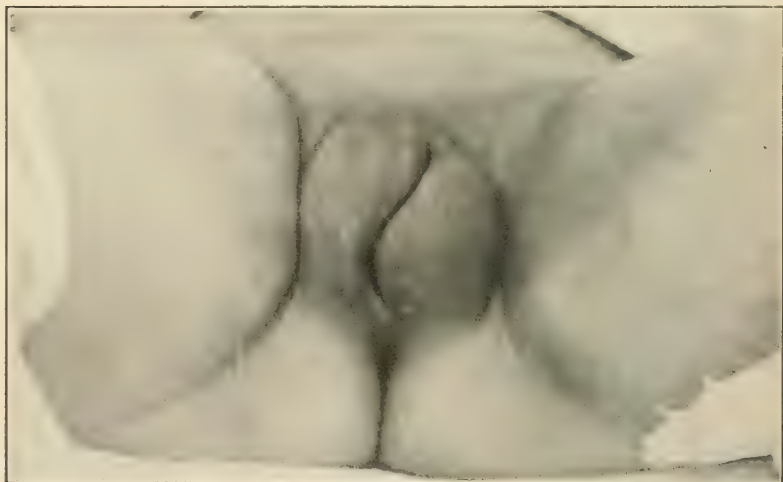


FIG. 1.—Bilateral Bartholin cysts complicating pregnancy at five months. Note the sigmoid contour of the introitus, and the upward dislocation of the right cyst by the one in the left labium.

Present Illness.—Has noticed swelling on both sides of vulva for ten months. She states that it is increasing in size is now painful, and is associated with moderate whitish discharge. Coitus had become very difficult and painful, and finally had to be abandoned. Urination and defecation normal.

Examination.—Stout healthy woman in good condition. Uterus corresponds in size to the fifth month of pregnancy. Both labia majora are distended by tense fluctuating cystic masses the size of oranges. There is no redness, tenderness, or discoloration of the overlying skin. The labia minora are not

visible and can be inspected with difficulty on crowding apart the two masses. They pass over the inner surfaces of the masses and are thin and considerably elongated. The clitoris and meatus urinarius are normal. The left mass, slightly the larger of the two, measures 11×8 cm.; it has dislocated the right mass (12×5 cm.) upward and outward, converting the vulvar orifice into a narrow sigmoid curved slit. Only with difficulty can one finger be introduced into the vagina. There is no impulse on coughing nor can any mass or pedicle be felt in the inguinal regions. The tumors reach from close to the anal margin right up to the rami of the pubes, against which they seem to impinge. They occupy the entire terrain of the labia majora, being covered on their outer aspect with skin, and on their inner side by the labia minora and vulvar mucosa; but they do not extend for any distance into the vagina. Exploratory aspiration of the left cyst reveals a thick chocolate colored fluid. No gonococci found in smears taken from the urethra and vagina.

Diagnosis.—Bilateral Bartholin cysts.

Operation.—Both cysts were readily peeled out of their surroundings through incisions along the mucocutaneous junction. The left cyst was removed intact, the right was ruptured in removal. They were more intimately adherent to the mucosa than to the skin, necessitating the sacrifice of a small portion of the right labium minus. Both cysts extended upward to the rami of the pubes, the periosteum of which was exposed in the upper angles of the wounds. They did not extend up under the lateral vaginal walls for more than 2 cm. There were several large spurting vessels to be caught and ligated in the depths of the wounds, and free general oozing which was controlled by packing. The wounds were sutured with a deep and superficial layer of catgut except for the lower angles through which gauze drains were passed.

Both cysts were unilocular with smooth lining, and thick chocolate colored contents.

After removal of the drainage and complete healing, there remained a gaping vulvar orifice with marked cystorectoceles in full view! The contrast between this state of affairs and the original tortuous introitus was very striking.

The case presents a number of interesting features—the fact that the cysts were bilateral, their size, perhaps the largest on record; the marked distortion and stenosis of the introitus; and the rapid growth during pregnancy. This last feature can readily be explained by the occurrence of hemorrhages due to the local congestion incident to pregnancy, and the trauma of attempts at coitus.

There can be no question that the only proper treatment for large cysts discovered during pregnancy is total extirpation. The earlier this is undertaken the better. The chances of induc-

ing an abortion by the operation are very remote; moreover, the stenosis of the introitus would give rise to considerable dystocia in labor. While of course the cysts could be punctured or incised during labor as an emergency measure, this would be a very undesirable procedure. The cyst contents are very apt to be a dirty grumous material, and while usually sterile, might very well harbor more or less virulent organisms, with very unpleasant possibilities in their wake.

The differential diagnosis of Bartholin cyst is by no means always easy. We must distinguish it from hernia, hydrocele of the canal of Nuck, cyst of Gaertner's duct, and solid tumors of the labium (fibroma, myoma, lipoma). Abscess, hematoma, and malignant growths will hardly offer any difficulties of diagnosis.

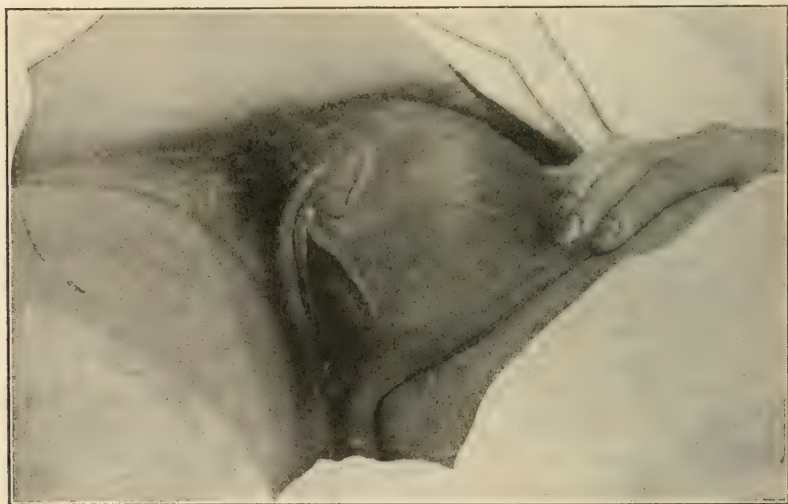


FIG. 2.—Irreducible inguinal hernia complicating pregnancy at six months. Mt. Sinai Dispensary, July, 1908. Note the extension of the swelling to the lower half of the labium.

The benign solid growths differ so materially in consistency that only the very soft semi-fluctuating fibromata will offer any difficulty. Here we may have to fall back upon aspiration or incision as a last resort. If the contents are clear and translucent, transillumination may decide the question.

Cysts of Gaertner's duct may occasionally involve the labium, but they extend so much further upward along the vaginal wall that their recognition is not difficult. In hydrocele of the canal of Nuck with a patent canal we can displace the fluid contents

upward into the peritoneal cavity. Even if the canal be not patent, the cystic swelling will be found occupying the upper rather than the lower part of the labium, and will extend upward into the inguinal region, or at least there will be a palpable strand connecting the mass with the inguinal region.

The most interesting diagnosis is from hernia. Here again the swelling will be found to occupy the upper more than the lower half of the labium, and can usually be felt to extend to the inguinal region. If the hernia is reducible there is no difficulty in differentiation. If the hernia is irreducible, the presence of an impulse on coughing and the distinct extension of the mass to the inguinal region will aid materially. If, as in the case illustrated in figure 2, there is a tympanitic note on percussion, or loops of intestine (with characteristic gurgling fremitus) are present, these are pathognomonic signs of hernia.

In doubtful cases it is wiser to trust to a careful exploratory incision to determine the diagnosis and therapy, rather than to the aspirating needle.

I am indebted to Dr. L. Jaches, radiographist of Mt. Sinai Hospital, for the photograph reproduced in figure 1.

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EPILEPSY AND PREGNANCY.

BY

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THE relation between epilepsy and pregnancy has apparently of late years attracted little attention in America. There is a dearth of communication in the journals, and the text-books upon obstetrics and internal medicine have little of interest in them upon the subject.

This lack of interest is rather remarkable when one considers the amount of work being done in almost every country upon eclampsia and the relation which manifestly exists between certain cases of this disease and epilepsy.

The influence of pregnancy upon epilepsy, the influence of epilepsy upon pregnancy, the relation between epilepsy and eclampsia, the difficulty of making a diagnosis, at times, between these two conditions, and the consideration of that interesting condition, the *status epilepticus* in its relation to eclampsia, makes the subject, it seems to me, one of great interest and considerable importance.

Two articles have appeared in the *Monatschrift f. Geb. u. Gynaek.* recently, one by Maximilian Neu, in 1907, and the other by E. Sachs, in 1910, upon status epilepticus and pregnancy. These articles have stimulated me to detail a case which was reported before one of the small societies in Washington several years ago, but which has never been published. The case is as follows:

Mrs. D., who was about thirty years of age and between the seventh and eighth month of pregnancy, came to Washington Sept. 9, 1906, from the country where she had been spending the summer, in order to be under the closer supervision of her physician. The history here recorded was obtained from Dr. Biscoe, her family physician, and from Dr. John D. Thomas, who had attended the patient in her only other pregnancy in 1903. According to the history, *petit mal* developed about the fifth month of this pregnancy. The labor, which was normal and which ended at noon June 3, 1903, was followed June 4 at 12.30 P. M. by a convulsion in which there was frothing at the mouth, biting of the tongue, a temperature of 100 to 102° F., pulse 120. On June 6, 7, 8, 12, and thereafter every day or two during her puerperium, there occurred attacks of what Dr. Thomas regarded as "*petit mal*." The urine was entirely normal during this pregnancy and puerperium and the subsequent course of the disease left no doubt that the diagnosis of epilepsy made by Dr. Thomas was correct. She had been well and strong before marriage. The family history was negative.

So far as I could obtain a history of the case in the interval between the pregnancies, it seems that she had what was regarded as epileptic attacks, at first occurring at intervals of every two or three months. These intervals grew gradually shorter. These fits were liable to come on at any time and she never went out without an attendant. In the attacks, she would fall down, be unconscious, bite her tongue at times, and be dazed and sleepy afterward. Upon becoming pregnant the second time, the intervals between the attacks decreased in length, and at the time of her return to the city, Sept. 9, they were recurring every few days. On account of her absence from the city, the urine had not been examined for weeks, but previous examinations had shown it to be normal. Her general condition had not been such as to cause alarm to her family.

On the night after her return to Washington, her husband was awakened about 2 o'clock by his wife, who was in the midst of a convulsion which he thought was one of her usual fits. He went to sleep again and was again awakened about 6 o'clock, finding his wife in another convulsion. He sent for Dr. Biscoe who arrived about 6.30 o'clock and found the patient unconscious and having severe convulsions every ten or fifteen minutes. On account of the history of epilepsy, he was inclined to regard the condition as a phase of this disease. I saw the patient about 8.30 o'clock and found her unconscious, cyanosed, with a rapid pulse, and having, every 10 or 15 minutes, convulsions which would begin with stiffening of the body, and beginning cyanosis; there would follow twitching of the muscles of the face and general clonic spasms of the whole body. I suspected puerperal eclampsia and obtained a specimen of urine which contained a marked trace of albumin and hyaline and granular casts. This condition of the urine and the fact that the patient was pregnant, made me regard the case as one of probable eclampsia and she was sent to Columbia Hospital where the cervix was dilated by the Harris method, and the child delivered at 11 o'clock by version. The patient showed no edema and there was no evidence that labor had begun. Before sending her to the hospital, she was given $\frac{3}{8}$ grain of morphine hypodermically, and she did not have another convulsion until 1.20 o'clock, when convulsive twitchings of the face were noticed. These twitchings recurred at 1.30 o'clock and 1.45 o'clock. At 2.15 o'clock there was a slight general convulsion lasting one-half minute. At 2.20 o'clock convulsive twitchings of the hands and face were noticed, and at 2.45, 2.50, 3.00, 3.10, 3.20, 3.35 o'clock slight convulsions. At 3.45 there was a convulsion lasting two minutes. From this time until her death at 6.30 o'clock P.M., Sept. 11, general convulsions, lasting from 1 to 3 minutes, occurred at short intervals, 138 convulsions being noted on the chart from 1 o'clock P.M., Sept. 10, until 6.30 o'clock P. M., Sept. 11. As she was having them every ten or fifteen minutes before her delivery for several hours, she must have had at least 150 convulsions altogether. She was never conscious after 6 o'clock A. M., Sept. 10. Her pulse, which had been rapid before the first hypodermic of morphine, decreased to 100 immediately after delivery, but from this time increased steadily in rapidity until her death. At 1 o'clock P. M., Sept. 10, her temperature was 102.5° F. and this rose steadily until she died when it was 106° F. An autopsy was not allowed.

As has been stated, the urine when first examined, contained a marked trace of albumin, and hyaline and granular casts. Specimens examined soon after reaching the hospital and after delivery showed a trace of albumin, hyaline and granular casts, no sugar, specific gravity 1020, and urea 12 grains to the ounce. At first the quantity did not appear to be markedly diminished, but toward the last she secreted very little. In spite of the

usual cathartics, the bowels did not move, although she expelled gas. She was given morphine, bromides, and chloral, none of which seemed to control the convulsions after their recurrence subsequent to delivery. Attempts at sweating by means of the hot pack and hot air did not produce the desired effect. Saline solution was freely used also. I will not go further into the details of the treatment, but will state that nothing except chloroform and the first hypodermic injection of morphine had any apparent effect upon the convulsions.

An interesting feature of the case was the diagnosis. At first sight I thought the case to be one of puerperal eclampsia occurring in an epileptic. The association of the two conditions was very interesting, however, and since looking up the subject in the journals, I have grave doubts as to the correctness of my diagnosis. The facts which we have in this case upon which to base a diagnosis are: the history of previous attacks of epileptic convulsions, the existence of pregnancy, the nature of convulsions, the condition of the urine, the absence of the involuntary passage of feces and urine, the pregnancy, the absence of labor pains, and, finally, the fatal termination of the illness, in spite of the usual treatment of eclampsia. There is absolutely no doubt but that the woman was an epileptic whose fits had begun in her former pregnancy and which had increased in frequency during the pregnancy which terminated fatally. While there is no positive proof that the fatal illness was the status epilepticus, it is at least very suggestive. There is nothing in the nature of the convulsions themselves by which one could distinguish between epilepsy and eclampsia. She never was conscious after she was first seen by a physician and there is no way of distinguishing a convulsion of eclampsia from one of *grand mal* when the patient remains unconscious between the seizures.

The condition of the urine would rather indicate eclampsia. It contained albumin in small quantities and also casts. This condition is not usually found in epilepsy. The quantity secreted was not markedly diminished at first, the specific gravity and the amount of urea were rather high, which would indicate that the kidneys, at the beginning of the illness, were acting well. The absence of the involuntary passage of urine and feces were in favor of eclampsia, but these are not certain signs. The existence of pregnancy, while favoring eclampsia in the average case, was not so significant in our patient, for her epilepsy had originated in one pregnancy and had grown worse in this one.

The absence of labor pains did not mean much one way or the

other, at this stage of pregnancy. The fatal termination of the illness, in spite of the emptying of the uterus and the use of the usual remedies with the kidneys acting well, would be, I think, in favor of the status epilepticus. The blood pressure was not measured. No autopsy could be obtained so that the diagnosis must remain obscure. The elevation of temperature toward the termination of the disease occurs both in eclampsia and the status epilepticus.

Oliver reported in the *Lancet*, 1894, a case of what appeared to be status epilepticus, where the woman's temperature reached 109° F. just prior to her death. It is a well recognized fact that in the status epilepticus the temperature not infrequently reaches a maximum of 106° F. to 107° F.

As before stated, in considering the subject, three questions naturally arise, namely: (1) What is the influence of pregnancy upon epilepsy; (2) what is the influence of epilepsy upon pregnancy; and (3) what is the relation between epilepsy and eclampsia.

Most authors state that pregnancy does not figure in the etiology of epilepsy. Neu says that if pregnancy were a true cause of epilepsy, then the subjects of the disease would be greater in the female than the male sex, while in truth it is just the opposite.

Starr, in his book on "Nervous Diseases," says that childbirth seems to be too vague and uncertain to be accepted as a true etiological factor in epilepsy. In Osler's "Modern Medicine" it is simply stated that there seems to be a relation between pregnancy and childbirth and epilepsy. Zweifel, in his text-book on obstetrics, 1895, says that when pregnancy supervenes upon epilepsy, the fits appear to occur less frequently. In an article, however, upon eclampsia in the *Archiv. für Gynaekologie*, 1904, he states, in reporting some cases whose histories bear out the truth of his remarks, that in epilepsy it is presumed that there exists a markedly increased predisposition for the occurrence of fits, and that in the individual who has this predisposition, the disturbances incident to pregnancy is much more liable to call forth a seizure than in the ordinary patient. He quotes Glockner as asserting that psychiatrists in a general way regarded eclampsia as a phenomenon occurring in individuals with a predisposition to epilepsy. Zweifel regards such cases as pseudoeclampsia and says in this way one can explain those cases in which convulsions occur in successive pregnancies. Binswanger says that pregnancy can increase the lesions which cause the convulsions

of epilepsy, and can bring about an outbreak of severe attacks after a period of cessation for years. There are cases reported which go to show that pregnancy can and does, in a certain percentage of cases, cause the epileptic seizures to become more frequent and severe, and even to produce the status epilepticus.

I have not the slightest doubt that a fair proportion of the convulsions which occur in pregnancy, in labor, and in the puerperium and which are regarded as eclamptic, can, as correctly, be considered as epileptic. Fellner, in forty-one cases of epilepsy occurring during pregnancy, reported from Schauta's Obstetrical Clinic, had two cases where the attacks occurred *only* during pregnancy, and three others where the patients had not had a convulsion since childhood. Curschmann, from his observation on a case of his own, thinks there is a causal relation between epileptic convulsions and pregnancy, and believes that pregnancy creates an irritation to the central nervous system which might lead to an outbreak of genuine epilepsy.

Nerlinger's statistics in ninety-two women who were subjects of epilepsy and who were observed in 157 pregnancies are interesting. In forty-four pregnancies the attacks were entirely absent; in twelve, less frequent; in twenty-three the relative frequency and violence were not given; in one, absent in the early months and more frequent in the latter months of pregnancy; in another, just the opposite; in eighteen they remained unchanged; and in fifty-seven the attacks were more frequent or more violent or both. That is to say, in 47 per cent. of cases pregnancy exercised either no influence on the attacks or an unfavorable one, while in 36 per cent. of them the attacks were made worse. Neu has, in the 1907 *Monatschrift für Geburtshülfe und Gynäkologie*, reported a very interesting case of a primipara in the seventh month of pregnancy, giving a history of an unstable nervous system and a middle ear suppuration who developed what was regarded both by the obstetricians and neurologists, as typical attacks of epilepsy, and finally died in the *status epilepticus*, having had twenty-six attacks in the last twenty-three hours of life. She was unconscious during this time, had involuntary passage of urine and feces, had a temperature of 101, and a pulse increasing to 140. The urine contained no albumin nor casts. The autopsy showed nothing typical of eclampsia, but hyperostosis and osteosclerosis of the skull. The diagnosis was epilepsy. He also cites a case of Charpentier of a woman who from birth was an epileptic and who from the end of the

first pregnancy had frequent convulsions. From the sixth week of the second pregnancy, the fits recurred with increasing frequency and during the sixth month were of daily occurrence. Suddenly they became more severe and more frequent with symptoms of meningoencephalitis. She died at the end of forty-eight hours in a state of acute mania.

Sachs, in the December number of the *Monatschrift für Geburtshülfe und Gynaekologie*, details a case in which the woman, who was five months pregnant, was brought into the hospital because she had fallen and injured herself in an epileptic seizure. She was subject to such seizures and had married upon medical advice to be cured of her malady, as her two sisters who had been epileptics had experienced no attacks subsequent to marriage. In the case of Sachs' patient, the convulsions had grown more frequent since conception, and at the time of her admission to the hospital she was having them daily. The examination showed nothing to indicate any intercerebral disease and the urine was normal. She had several fits upon the day of her admission, and upon the day subsequent, and remained in a state of coma between the attacks. Bromides, chloral and morphine were freely administered with no lasting results. On account of the increasing seriousness of the patient's condition, the uterus was emptied. After delivery, the patient went from one convulsion into another into what was regarded as the status epilepticus, and died. The autopsy showed some adhesions between the dura mater and the skull, but nothing whatever to indicate eclampsia.

It appears to me that in view of this evidence, we may say that while pregnancy cannot be considered to be a true cause of epilepsy and while it seems to have a beneficial influence upon this disease in a small majority of the cases, that in a certain number of them it exercises a markedly malign influence, and in a few instances, such as the cases of Neu, Sachs and myself, it has, perhaps, caused a fatal termination by producing the status epilepticus.

The second phase of the question is the influence of epilepsy upon the course of a pregnancy. Williams in his obstetrics thus briefly discusses the subject. "This disease (epilepsy) appears to have no effect upon pregnancy, though at the time of labor it may be mistaken for eclampsia by inexperienced observers. If the attacks are frequent, the patient should be put upon large doses of potassium bromide and treated just as at other times.

As a rule, it is not advisable to allow the mother to nurse her child, as lactation sometimes appears to aggravate the disease, while serious injury might be done the child during an attack." The majority of obstetricians take about the same position. Other writers, notably among who are Binswanger, Fellner, Schauta, and Krauss, take a different view. Binswanger says that in epilepsy the advisability of terminating the pregnancy should always be considered. Cases come to hand in which the indications for the induction of a premature labor are present, namely, when simple epilepsy without psychical injury, with simple, occasional convulsions is changed during pregnancy into more frequent and more severe convulsions with deep long continued unconsciousness and severe psychical disturbances.

Fellner states that only where the fits are extraordinarily increased should the production of premature labor be considered. Schauta believes that only in very severe cases should this procedure be thought of. Krauss makes this statement: "In epilepsy, it is advisable to bring on a miscarriage in a primipara when the frequency and severity of the attacks brought about by the pregnancy threaten to cause real mental disease such as idiocy; and in multiparæ when from the comparison of the progress of the disease in the present pregnancy to the history of the previous pregnancies makes it evident that the woman, the mother of living children, will suffer a further severe psychical injury to her nervous system."

Wagner V. Jauregg expresses himself about as follows: "Epilepsy in itself is never an indication for the induction of an abortion. The induction of an abortion is allowed in those cases in which the epilepsy through the pregnancy is made so much worse that danger ensues. When the convulsions under the influence of pregnancy so increase that severe coma and with it the danger of an incurable mental disturbance ensues then one may consider an artificial abortion." Sachs says that a cure of epilepsy by the spontaneous interruption of pregnancy has been found only in those cases in which the epilepsy made its appearance in the pregnancy, hence one can reason that the only cases in which the induction of an abortion is indicated are those in which the convulsions have arisen or grown markedly worse during the pregnancy. This he says does not hold with the status epilepticus, for no reported case has been cured by this means. When, however, the status epilepticus occurs in labor, it is desirable to terminate the labor as speedily and with as little

disturbance to the patient as possible. Several writers emphasize the advisability of emptying the uterus in such cases in the interest of the child when it is viable, and the condition of the mother hopeless. It is seldom that the fits themselves in simple epilepsy produce an abortion or premature labor.

The third phase of the subject is to me the most interesting, that is, the relation between epilepsy and puerperal eclampsia. Eclampsia is as yet, as Zweifel says, a disease of theories. Nothing very definite is known concerning its etiology. It is characterized by fits or convulsions which resemble, in most respects, the convulsions of *grand mal*. The fatal termination of a certain number of cases of puerperal eclampsia are directly due to these convulsions and the more frequent and severe they are, the worse the prognosis, other things being equal. Now it seems to be generally acknowledged that a convulsion is more easily brought about in an individual who has been accustomed to having them. In short, one may have, so to speak, the "fit habit" and in such a person temporary conditions such as indigestion, which would not have any effect upon an individual with a stable nervous equilibrium, might produce convulsions. We, at times, see symptoms such as headache, albuminuria, edema, disturbed vision, etc., which are considered premonitory of eclampsia and yet the patient does not have a convulsion. Such a condition would doubtless promptly produce convulsions in another patient who was the subject of epileptic fits. Dührssen, at the meeting of the British Medical Society at Toronto in November, 1906, in discussing eclampsia, expressed himself as believing in two varieties, eclampsia reflectorica and eclampsia toxica. In the former, which he says occurs in 5 per cent. of all cases and chiefly in very young and old primiparæ, the individual predisposition to nervous explosions plays an important rôle and there may be, in these cases, little evidence of intoxication from the kidneys or liver.

Zweifel, Sachs, Curschman, Binswanger, Fellner and others believe that in many cases of eclampsia, there is a predisposition on the part of the patient to convulsions. Until we know more about the nature of eclampsia and of epilepsy, we should be very careful not to consider every convulsion which occurs in pregnancy, labor or the puerperium as eclamptic. This is especially true of those cases where the urinary findings are negative. In the case of our patient, no matter whether the convulsions were eclamptic or epileptic, it would seem a logical conclusion that her

death was due, in large part, to the fact that she was the subject of epilepsy and the following conclusions seem warranted:

(1) In women with epilepsy where pregnancy apparently causes the convulsions to become more frequent or more severe, one should always consider the necessity of terminating the pregnancy.

(2) In cases of pregnancy in epileptic women, one should watch with extreme care for indications of toxemia or the premonitory signs of eclampsia, and should put an end to pregnancy at the appearance of symptoms of much less gravity than would indicate this procedure in women who are not the subjects of disease.

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SCHOOLS FOR MIDWIVES.*

BY

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THE practice of midwifery dates back to the beginning of human life in this world. At this supreme moment of motherhood it is probable that some assistance has always been required and given. Its history runs parallel with the history of the people, and its functions antedate any record we have of medicine as an applied science. To deny its right to exist as a calling is to take issue with the eternal verities of life. The only points upon which we may argue are the training required for its safe and lawful practice, and the essential fitness of those who follow this calling requisite for the safeguarding of the mother and child.

That Socrates' mother was a midwife bears testimony to the honorable nature of such a profession at a time when civilization in one of its highest forms was at its summit.

With the advances that medicine has made we are all familiar. Midwifery as one of its component parts has achieved a high type of efficiency, but the midwife, per se, has been left behind in the march of progress and, untrained and unsupervised, has absorbed a large part of the work of caring for childbirth, without being regarded as a serious competitor to the trained physician or, indeed, as of any particular importance as a factor in obstetrical practice. The evil has been insidious. Europe was aroused to

* Read before the Annual Meeting of the Association for the Study and Prevention of Infant Mortality held in Chicago, Ill., November, 1911.

the danger of the situation some twenty years ago. Here in the United States we have either carried on a mild sort of supervision of midwives, ignored them completely, or, in a few instances, passed mandatory legislation officially stamping them as non-existent, and then neglected to make any provision to see that they remained so.

At the present time ignoring the midwife is criminal culpability, but denying her existence is a state of sublime ignorance that bears the elements of humor, but is essentially tragic in its consequences.

In the large cities of this country we must face the fact that the midwife is a permanent part of our social structure. To a lesser degree this fact is equally true in smaller communities and rural districts. Our vast alien population maintains the traditions of its home countries in matters pertaining to its personal habits, and the midwife is an intrenched institution in those parts of Europe which are furnishing us with the larger class of our immigrants. From a study of a large number of cases in New York City I have found that the average cost of a midwife's services is eight dollars. This amount almost universally includes attendance during the confinement, daily visits for at least ten days thereafter, nursing care (crude though it may be) and many housewifely duties, including sometimes the preparation of meals and general care of the household. Contrast this with the service rendered by the average physician for the same amount of money, and it is easy to see one of the main reasons why the midwife will continue to be employed, whether or not the law recognizes her existence.

The dangers of the unsupervised practice of the untrained midwife are matters of elementary knowledge and need not be recounted. One point, however, merits attention—that is, the so-called criminal practice which has been widely discussed, and which by many investigators is considered the most serious indictment of the midwife as she exists to-day. This criminal practice, which mainly is concerned with the production of abortions, bears the same relation to the practice of midwifery by midwives as it does to the practice of medicine by physicians. In either case it is the illegal practice of medicine, amenable to laws which are in effect in practically all states, and directed toward the prohibition of this practice, irrespective of whether the offender be physician, midwife or layman. That a midwife may be guilty of the illegal practice of medicine is no more an

indictment against her legitimate sphere of practice than it is an indictment of the practice of medicine if a physician be found guilty of the same offense. That there may be more danger to be feared in the case of the midwife is true, but the legal status of the crime is in no sense altered. While medical examining boards and boards of health should refuse to issue a license to practise to any midwife found guilty of this crime, and should revoke any license already in effect for the same cause, the action should be equally drastic in the case of any member of the medical profession under like circumstances.

The methods of control of midwives in the United States are remarkable mainly for their deficiency. Most of the European countries have met the situation in a much more able manner, and the best midwives in this country are those who have been graduated from European schools. In this country, in the few instances where we have been aroused to the necessity for action, we have remained content to pass a more or less drastic law requiring an examination before a license to practise is issued, or in many cases prescribing certain regulations of the practice with no machinery for enforcement, and no provision for further supervision to see that the law is obeyed. Europe has struck the keynote by not only recognizing that preliminary education and training is essential, but in most instances providing facilities for procuring it, but even here the situation is not wholly satisfactory.

Accurate data regarding this matter has been difficult to procure, as the work is in a transition period in many countries, and literature on the subject is meager and conflicting. In general the situation is as follows:

None of the European countries have laws which regulate midwifery practice throughout each respective country. The authorities complain of lack of uniformity. Apparently the situation is better in Germany than in the other European countries, but here too the regulations are better in some provinces (Saxony, for example) than in others. Statements in regard to the conditions as usually found are often misleading, as they apply only to certain cities or districts.

Germany.—No uniform regulations exist for the empire. A midwife can practice only in the state in which she has passed her examination. If she goes to another state it is necessary for her to take another examination.

A Prussian law of May 10, 1908, regulates the fees of mid-

wives. At present there is a strong movement toward reform, and an attempt is being made to

1. Improve the social standing of midwives;
2. Appoint a definite number to practice in each district, based upon the number of inhabitants;
3. Induce well-educated women to practice midwifery;
4. Insure against sickness and old age.

Austria.—The conditions are similar to those of Germany, but not so favorable.

Switzerland.—There are no uniform regulations for the entire country. Each of the twenty-three cantons has its own.

France.—Here also there are no general regulations holding good for the entire country. There are, however, two classes of midwives licensed—those who may practice anywhere in France (these have a more complete training), and those who are allowed to practice only in certain districts, and who have had a more elementary previous education and training.

England.—By Act of Parliament, after March 31, 1910, no uncertified midwife can practice. The provisions of this Act are carried out by the Central Midwives Board. This Board selects subjects for study, holds examinations, and keeps a record of all midwives. The Board regulates the practice of midwives, sits as a court to hear charges preferred against these women, and supervises them by visits of an inspector.

NUMBER OF MIDWIVES.

The following table of the number of midwives in the various countries has been compiled from Prinzing and other sources.

Country	Number of midwives	Year	Number of midwives to 10,000 inhabitants	Average number births annually each midwife
Germany.....	37035	1898	6.8	55
(Prussia).....	20878	1907	5.7	63
Austria.....	20000	1909	7.3	51
Switzerland.....	3305	1903	10.1	29
Norway.....			5.5	53
France.....			3.4	67
England.....	27238	(registered 1909)	7.3	38
Italy.....	15000	(active practice)	4.3	81
Russia.....	14000		.9	550

NUMBER OF INSTITUTIONS AND NUMBER OF PUPILS.

Germany.—In 1908 forty-three institutions for training midwives. Of these twenty-seven in Prussia, four in Bavaria, three in Baden, two each in Saxony, Hessen and Thuringen; the rest scattered, one in each of the remaining provinces.

Prussia.—1907-1908: twenty-seven institutions, with 925 pupils.

Netherlands.—Amsterdam and Rotterdam, thirty pupils annually.

Paris.—Seventy-six pupils; thirty-five two-year and forty-one one-year courses.

INCOME OF MIDWIVES.

	Average fee normal case	Average annual income
Germany.....	\$.50-\$4.00	\$75.-\$100.
Austria.....	2.00	60.- 75.
Switzerland.....	6.00	80.
Russia.....		50.- 75.
England.....	1.00- 4.00	

TRAINING.

(Previous to entrance to schools.)

The requirements for admission to the schools throughout Europe vary greatly, but generally include an age limit, good health, moral character and a definite previous education.

Prussia.—The applicant must be healthy, between twenty and thirty years of age, of good character, must not have had an illegitimate child or be pregnant, and must have had an elementary education including reading, writing and simple arithmetic.

Russia.—No definite requirements can be ascertained, but investigation has shown that 60 per cent. of the midwives have attended public schools.

Netherlands.—An age limit of between twenty and twenty-six years is required.

England.—The applicant must be at least twenty-one years of age and present vouchers of good character. An elementary education, including reading and writing, is required.

France.—Age limit of nineteen to thirty-five years. Applicant must not be pregnant and must have preliminary education to include reading, writing and arithmetic.

Professional Training.

Prussia.—An average of nine months. May vary from six months to one year.

France.—One or two years. In Paris the second year is optional, but from 25 to 50 per cent. take the advanced course.

Italy.—At the universities two or three years, but this often includes the time spent in giving the midwives an elementary education, as many applicants cannot read or write.

Switzerland.—At the schools and universities from six months to one year.

Japan.—At university and private institutions one year,

Netherlands.—At Amsterdam and Rotterdam two years. Must conduct at least ten cases of labor, and pass an examination at the end of the course.

Russia (some parts).—Three years, including general education.

Belgium.—Two years.

Scandinavia.—One year.

England.—Six to nine months. The midwife must deliver and nurse at least twenty cases of labor during her period of training.

In all countries the method of instruction is similar—partly didactic and partly practical.

EXAMINATIONS.

Germany.—Oral and practical. The certificate gives only the right to practice in the state in which the examination takes place.

France.—Oral and written.

Japan.—Examination is held before the chief of the training school, a public medical officer and two obstetricians.

England.—Oral and written before the Central Midwives Board.

Prussia.—All midwives are expected to be examined once in three years. This requirement, however, is not closely followed.

COST OF TRAINING.

Germany.—From \$65 to \$150.

France.—The two years' course costs approximately \$200.

England.—From \$100 to \$150.

SUPERVISION.

Germany, *Austria* and *England* have special supervising inspectors, a definite number of midwives being assigned to each.

Midwives are required to keep a day book with records of cases attended and deaths. The equipment is regularly inspected.

In order to determine the existing conditions in regard to the control of the practice of midwifery in this country, the following questions were sent to the State Board of Health in every state:

1. Is the practice of midwives in your state regulated? If so, will you kindly send me a copy or abstract of the law?
2. How many midwives are practising in your state?
3. How many births are reported annually by midwives?
4. What per cent. of the total births reported does this represent?
5. Are schools for midwives under special regulation?
 - (a) If so, what is the method of control?
 - (b) What public department exercises supervision over them?
 - (c) How long is the course in these schools?
 - (d) What is the curriculum?
 - (e) How many such schools are there in your state?
6. If you have any literature regarding midwives will you kindly enclose it.

Thirty-five sets of answers were received. (See Table I.) Thirteen states have laws regulating the practice of midwives, yet only six knew the number of midwives in the state, and only one could state the number of births reported by them. Any system of supervision or enforcement of the law could not be determined in any state except as the matter was delegated to the local authorities of cities or towns. In two states the presence of midwives is not officially recognized, the law requiring that any person must qualify as a Doctor of Medicine in order to practice midwifery.

Similar letters of inquiry were sent to the most prominent cities in each state. Twenty-eight replies were received. Eleven were acting under the state law, while four had local ordinances or a state law applying only to the city in question.

In only two states—Ohio and Utah—was it conceded that any schools for midwives existed, Ohio having one under no supervision, and Utah two, under state supervision, with a required six-month course of study, yet with the curriculum unknown to the governing authorities of the cities. Trenton, New Jersey, was the only city where the number of schools was definitely stated, and these were not supervised. Milwaukee, Wisconsin, stated that the schools were under supervision, but gave no in-

formation as to their number or method of control. (See Tables I and II.) The lack of knowledge of conditions and the inadequacy of control are lamentable. It is evident that a widespread campaign of education is urgently needed in this direction.

In two cities a definite beginning has been made toward the solution of the problem. In Philadelphia Dr. Newmayer, the efficient chief of the Bureau of Child Hygiene of the Bureau of Public Health, not only personally examines each applicant for a license but refers each applicant who is deficient in training to the Philadelphia Hospital, where she is instructed in the essentials of the care of cases of normal childbirth. New York City is entitled to the honor of having established the first School for Midwives in the United States under municipal control. During the summer of 1911, Dr. John Winters Brannan, President of Bellevue and Allied Hospitals of New York, obtained from the city a special appropriation for this purpose, and in July this school was officially opened.

It is situated in a separate building, devoted exclusively to that work, and now has accommodations for eight patients, with a possibility of expansion within the near future. The present class of midwives numbers eight; others have entered from time to time but have left the school either because they were not fitted for the work, or because they refused to take so long a course. The length of the course has been placed at six months. The midwives live in the building all the time, observe each case that is received, and in turn they are allowed to deliver cases under the supervision of the house physician. A resident physician and a superintendent of nurses are in charge. Three lectures a week are delivered to the midwives by the resident physician. These lectures cover the elementary and practical points in the diagnosis of pregnancy, the management of normal labor, the diagnosis of abnormal conditions existing at labor, and the care of the mother and child during the puerperal period. The nurse in charge delivers three lectures weekly, covering somewhat the same subjects from the nursing point of view. These lectures are made as practical as possible, couched in simple language, and the cases observed by the midwives are used as subjects for description and demonstration.

This school is maintained as part of the nursing work at Bellevue Hospital, and is under the immediate direction of the Superintendent of Nurses. Special effort is made to train these midwives in the fundamental points of nursing of pregnant

TABLE I.

Name	1. Practice of midwives regulated by law	2. Number of mid- wives in state	3. States number births reported annually by mid- wives	4. Per cent. of total births reported by mid- wives	Schools for midwives		
					5. Under special control	A. Method of con- trol	B. Char- acter of control
Alabama.....	No.....	3000	25000	55.60	No.....		
Arkansas.....	No.....						
Colorado.....	No.....	Not known			No.....		
Connecticut.....	Yes.....	125	Not known	Not known	No.....		
Delaware.....	No.....				No.....		
District of Columbia.....	Yes.....	207	1218	17.3	No.....		
Florida.....	None.....	Not known	Not known	Not known	No.....		
Idaho.....	?	Not known	Not known	Not known	No.....		
Illinois.....	Yes.....	Not known	Not known	Not known	No.....		
Iowa.....	No.....		None.....	None.....	No.....		
Louisiana.....	Yes.....	276	Not known	Not known	No.....		
Maine.....	No.....	Not known	Not known	Not known	No.....		
Maryland.....	Yes.....	284	Not known	Not known	No.....		
Massachusetts.....	No.....	Not known	Not known	Not known	No.....		
Michigan.....	No.....	Not known	Not known	Not known			
Minnesota.....	Yes.....						
Montana.....	No.....	Not known	150	.2	No.....		
Nebraska.....	Not recognized						
Nevada.....	No.....						
New Hampshire.....	No.....	Not known	Not known	Not known	No.....		
New Jersey.....	Yes.....						Yes.....
New York.....	No.....	266	Not known	Not known	No.....		
North Carolina.....	No.....						
Ohio.....	Yes.....	450	None.....	None.....	No.....		
Oklahoma.....	Yes.....						
Rhode Island.....	No.....	200	Not known	Not known	No.....		
Utah.....	Yes.....	Not known	Not known	Not known	Yes.....	See note	See note
Vermont.....	No.....	Not known	Not known	Not known			
Virginia.....	No.....	Not known	Not known	40.	No.....		
West Virginia.....	No.....		None.....	None.....	No.....		
Wisconsin.....	Yes.....						
Wyoming.....	Yes.....	5	Not known	Not known	No.....		
Oregon.....	No.....	Not known	200	5.	No.....		
Albany, N. Y.....	No.....	6	300	19	No.....		
Baltimore, Md.....	Yes.....	146	Not known	Not known	No.....		
Binghamton, N. Y.....	No.....	4-5	196	21	No.....		
Boston, Mass.....	No.....	Not known	None.....	None.....	No.....		
Bridgeport, Conn.....	Yes.....	20	1555	53	No.....		
Buffalo, N. Y.....	Yes.....	50	Not known	Not known	No.....		
Columbus, Ohio.....	Yes.....	Not known	Not known	Not known	No.....		
Fall River, Mass.....	No.....	45	850	20	No.....		
Grand Rapids, Mich.....	No.....	21	416	14	No.....		
Holyoke, Mass.....	No.....	6	305	20	No.....		
Jersey City, N. J.....	Yes.....	115	Not known	53	No.....		
Kansas City, Mo.....	Yes.....	12	100-125	2-3	No.....		
Los Angeles, Cal.....	Yes.....	130	528	10	No.....		
Louisville, Ky.....	No.....	25	400	10	No.....		
Mempis, Tenn.....	Yes.....	40	50-100	Not known			
Milwaukee, Wis.....	Yes.....	140	3948	25	Yes.....		
New York City.....	Yes.....	1300	50000	45	No.....		
Omaha, Neb.....	Yes.....	18	500	5	No.....		
Philadelphia, Pa.....	Yes.....	178	8640	24	No.....		
Portland, Me.....	No.....	1	6-7	Not known	No.....		
Providence, R. I.....	No.....	39	1536	31	No.....		
Reading, Pa.....	No.....	12	300	12	No.....		
Richmond, Va.....	No.....	120	1230	45	No.....		
Rochester, N. Y.....	Yes.....	16	1500	33	No.....		
St. Paul, Minn.....	Yes.....	207	Not known	Not known	No.....		
San Francisco, Cal.....	No.....	60	100	16½	No.....		
Syracuse, N. Y.....	No.....	12-15	425	15	No.....		
Trenton, N. J.....	Yes.....	672	Not known	Not known	No.....	See note	

Blank spaces mean that information asked for could not be furnished.

TABLE I—*Continued.*

Schools for midwives			6. Litera- ture re- garding mid- wives	
C. Length of course	D. Curricu- lum	E. Number of schools		
.....	None.....	No.	
.....	Not known	No.....	No registration of vital statistics; no information.
.....	None.....	Yes	
.....	None.....	Yes	
.....	Not known	No.	
.....	Not known	No.....	5. Examined and licensed by Board of Medical Super- visors, then registered at Board of Health.
.....	Not known	No.	
.....	Not known	Yes.....	1. Midwives required to register.
.....	Midwives are licensed by the state and are examined by the State Board of Midwives, no provision for training is made.
.....	Not known	No.....	1. Not recognized, probably about 40 in state.
.....	Not known	No.....	5. Examination and license fee.
.....	None.....	No.	
.....	Not known	Yes.....	(b) Examination of applicants held twice yearly after advertising in newspapers.
.....	None.....	No.....	1. Midwives not recognized. Requirements same as for degree of M.D.
.....	None.....	No.	
.....	Not known	No.	
.....	None.....	No.	
.....	Not known	No.....	1. Requirements same as for degree of M.D.
.....	Not known	No.	No legislation or control—facts not known.
.....	None.....	No.	
2 years.	Not known	Yes.....	(b) State Board of Medical Examiners.
.....	Not known	Yes.....	1. Only requires that midwives report births—local laws for New York City and Buffalo.
.....	Not known	No.	
.....	1	Yes.....	(e) Quiz school—of little value.
.....	Not known	No.....	Statement only that practice of midwives is not for- bidden.
.....	None.....	No.....	1. Simply requires reporting of cases of ophthalmia neonatorum.
6 month	Not known	2	No.....	(a) State Board of Medical Examiners.
.....	Not known	No.	
.....	None.....	No.	
.....	Not known	No.	
.....	Not known	Yes.	
.....	None.....	Yes.....	(b) State Board of Medical Examiners licenses suc- cessful candidates.
.....	None.....	No.	
.....	Not known	No.	
.....	Not known	No.....	1. State Law.
.....	Not known	No.	
.....	None.....	No.....	Not recognized, fined if practising.
.....	Not known	No.....	1. State Law.
.....	None.....	No.....	1. Special laws for Erie Co. (b) only if complaint o violation of law.
.....	Not known	No.....	1. State Law.
.....	Not known	No.	
.....	None.....	No.	
.....	None.....	No.....	1. State Law.
.....	None.....	No.....	Examined by Health Commissioner and licensed.
.....	None.....	No.....	1. Local ordinance.
.....	None.....	No.....	1. Required to report births.
.....	Not known	Yes.	
.....	Not known	No.....	1. State Law.
.....	Not known	Yes.....	1. Special State Law applying to New York City.
.....	None.....	No.....	1. Required to register.
.....	Not known	No.....	All requiring training sent to Philadelphia Hospital.
.....	None.....	No.	
.....	None.....	No.	
.....	None.....	No.....	1. Required to register and report births.
.....	Not known	None..	1. Required to register.
.....	None.....	No.	
.....	Not known	No.	
2 years.	Not known	No.	
.....	6	No.....	(b) State Board of Medical Examiners. 1. State Law.

Blank spaces mean that information asked for could not be furnished.

women, and special attention is directed towards the care of infants, the necessity of breast feeding, and the manner and methods of artificial infant feeding.

In the school the midwives prepare the meals, are responsible for the neatness and care of the house, take all care of the patients as well as being in attendance at the confinement. The purpose is to provide a training which will include the housewifely duties, the essential methods of nursing, and the professional knowledge essential to the proper care of cases of normal labor.

Too much cannot be said in praise of this school. In its appointments and management it is eminently satisfactory. I am informed that it is proposed to develop the out-patient department as rapidly as possible, so that the women may have opportunity of confining women in their own homes, thus working under conditions which approximate those which will confront them when they start out as independent workers.

No special requirements for admission are maintained, but the applicant must be able to read and write, and must be of good moral character. No charge whatever is made for the course.

While this school is maintained by New York City, the Department of Health which controls the practice of midwives in the city, under a special state laws, has been unable to demand that all midwives shall be trained there before being allowed to practice, on account of its limited facilities. All women, however, who apply at the department for permits and who have not cared for the requisite twenty cases of childbirth are referred to the school for the necessary instruction. As soon as sufficient provision can be made to provide for the number of midwives in the city, this course preliminary to the granting of a permit to practice should be made compulsory.

As a further argument, if any is needed, for the establishment of proper schools for midwives, a survey of the situation in New York City may be used. The Department of Health, through the Division of Child Hygiene, supervises all midwives in the city, and requires that they obtain permits to practice. These permits are in force one year from the date of issuance, and must then be renewed. Before a permit is granted the midwife must submit evidence that she has attended at least twenty cases of childbirth; that she is of good moral character, and that she has never been convicted of illegal practice of medicine. A preliminary inspection of her home equipment and personal habits is then

made. After the permit is issued repeated inspections are made as nearly once a month as possible, to instruct her and to examine her bag and equipment. Infraction of any of the rules and regulations may be punished by the revocation of her permit. The use of silver nitrate solution in the eyes of the baby at the time of birth is insisted upon, and is furnished free of charge by the department. This form of supervision has been in effect for three years. So far as supervision can accomplish results, they have been satisfactory. There are at present 1344 permits in force, and during 1910 the midwives reported 51,996 births, or 40 per cent. of the total occurring in the city. In 1912 a special staff of five physicians and eight trained nurses have been provided to supervise this work. With this special staff it is believed that a higher standard of efficiency may be attained.

Of the total number of midwives, only 9.1 per cent. were born in this country; 26.4 per cent. are Italian, with Germany furnishing 23.1 per cent. and Austria 20.6 per cent. 1254 or 93.3 per cent. can read and write in their own language or in English, while 69 per cent. have had a common school education. 1085 presented a diploma from a school of midwifery when applying for a permit to practice. Of these 512 or 38 per cent. were from foreign schools, and showed evidence of a satisfactory training. 573 or 42.6 per cent. of the diplomas presented were from schools in the United States; 350 of these were from one school in New York City. It would seem from a study of these facts that the midwife herself has recognized the value of preliminary training when with no compulsion 80 per cent. of the applicants have voluntarily availed themselves of such a course. The adequacy of the training received in this country is open to question, yet the cost of the course in the school furnishing the majority of the diplomas is \$75.00, which must be an item of importance to many of these women. (See Table II.)

No amount of legal enactment for mere control after licensing and no amount of mere supervision, however faithfully carried out, will ever solve the midwife problem. If we are to meet and master the situation—and the need of such a course is imperative—we must insist that every midwife receive an adequate professional training before she is allowed to practice, and we must provide the proper schools for this purpose.

TABLE II.
MIDWIVES IN NEW YORK CITY.

	Total	Per cent.
<i>Number permits</i>	1344	
<i>Nationality:</i>		
Austrian	278	20.6
Italian	355	26.4
German	311	23.1
Russian	206	15.3
United States	123	9.1
Norway-Sweden	18	1.3
England-Wales	18	1.3
Swiss	9	.7
French	13	1.0
Finnish	4	.3
Greek	2	.1
Turkish	3	.2
Holland	2	.1
Miscellaneous	2	.1
<i>Education:</i>		
Read and write	1254	93.3
Cannot read or write	90	6.7
Common school	928	69.0
<i>Diploma from</i>		
United States	573	42.6
Foreign	512	38.8
Austria	179	
Italy	103	
Germany	53	
Russia	83	
Norway-Sweden	10	
England-Wales	8	
Swiss	3	
France	5	
Finnish	3	
Greek	2	
Miscellaneous	3	
Total diplomas	1085	
<i>United States Diploma presented:</i>		
Arrested	29	
Imprisoned or fined	1 (fined \$50)	
Condition of bag:		
Satisfactory	567	
Not satisfactory	6	
Condition of home:		
Clean	552	
Not clean	21	
Condition of person:		
Clean	566	
Not clean	7	

TABLE II.—*Continued.*

MIDWIVES IN NEW YORK CITY.

	Total	Per cent.
<i>Foreign diploma presented:</i>		
Arrested	9	
Imprisoned or fined		
Condition of bag:		
Satisfactory	504	
Not satisfactory	8	
Condition of home:		
Clean	504	
Not clean	8	
Condition of person:		
Clean	508	
Not clean	4	
<i>No diploma presented:</i>	259	19.3
Arrested	5	
Imprisoned or fined	1	
Condition of bag:		
Satisfactory	252	
Not satisfactory	7	
Condition of home:		
Clean	248	
Not clean	11	
Condition of person:		
Clean	252	
Not clean	7	

Even with a satisfactory course of training, continued supervision will always be essential, and in presenting this paper for the discussion which the importance of the subject merits, our summary of the essential features of the adequate control of the practice of midwives must include:

I. *State laws on midwifery:*

- (a) Defining the practice of midwives.
- (b) Requiring a definite course of study at a registered midwifery school.
- (c) Requiring the local health authorities to enforce the law.
- (d) A license to practice required and obtained yearly from the local Board of Health.
- (e) Continuous supervision of midwives' practice.

2. *Schools for midwives:*

- (a) Under state control, maintained under a license and subject to inspection.

(b) Required curriculum.

- (1) Six-months course.
- (2) Instruction and practical demonstrations of management of normal labor.
- (3) Diagnosis of abnormal presentations or positions and complications of labor.
- (4) Nursing during pregnancy, confinement and puerperium.
- (5) Infant hygiene and care.
- (6) Infant feeding.
- (7) The delivery and care of at least twenty normal cases of confinement.
- (8) All teaching to be practical, with actual demonstration of methods.

In conclusion I wish to record my appreciation of the valuable aid of Dr. Charles Herrman in the review of the situation existing in the various European countries.

33 WEST 96TH STREET.

THE TREATMENT OF PROLAPSUS UTERI BY VAGINOFIXATION.¹

BY

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UTERINE and vesical prolapse has been the subject of much honest endeavor by the medical profession for many decades. We read, with much interest, of the numerous mechanical devices which have been used to relieve and cure this difficulty in the past, and which, like Perkin's Tractors, have been relegated to the curio museums of medicine. It is interesting to note that the early surgical attempts, like those of the present time, were largely plastic.

Suture of the labia, cauterization of the vaginal walls, denudation and suture of the vaginal walls, were preliminary steps in the development of the classic plastic procedures of Sims and Emmett. Naturally intraperitoneal methods of treatment arose, and when the abdominal route became safe to follow, combinations of abdominal and plastic methods multiplied until it would seem that any further discussion of the

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

subject would be unnecessary. With the swing of the pendulum, however, there has been a tendency to return to plastic procedures, and while the last word on this subject is yet to be spoken, the success attending these measures warrants us in considering them most seriously in our treatment of prolapse.

This paper will deal mainly with complete prolapse, that is to say, true pelvic hernia, for while decensus uteri and partial prolapse are amenable to the same form of treatment, they are also successfully treated by a variety of other methods, which can only be touched upon in passing.

In complete prolapse, the bladder is extruded—generally the rectum and uterus covered by everted vaginal mucosa.

Let us review briefly some of the important topographical and anatomical points bearing upon our subject. Normally the uterus is found lying at an acute angle with the long axis of the vagina, the latter extending obliquely upward and backward toward the hollow of the sacrum.

Dudley (*Journal A. M. A.*, Nov. 17, 1906), has called attention to the importance of the acute angle between the uterine and vaginal axes in the treatment of prolapse—it being obvious that one of the conditions required for the descent is the coincidence of these axes. It is also to be noted that the levator ani, covered by the layers of fascia, forms a complete support for the pelvis—bowl-shaped and perforated by the urethra, vagina and rectum. The uterus is loosely held in position by four sets of ligaments; the round ligaments, with the uterovesical ligaments, and the peritoneal attachment of the bladder direct the fundus forward, in addition, the pressure of the abdominal contents assist in maintaining this position. The uterosacral direct the cervix backward, and the broad ligaments tend to hold the uterus up and prevent lateral inclination. These ligaments, with the exception of the round, which are muscular, are comprised of peritoneal reflexions, containing connective tissues, and some unstriped muscle fibers. They are in no sense suspensory, but act as guy ropes in restricting the mobility of the uterus.

The chief support of the uterus is the pelvic floor, and the basis of this is the levator ani and its fascia which maintains the long axis of the vagina obliquely upward and backward, so that the force of the intraabdominal pressure strikes the axis of the vagina at a right angle. These factors are mutually dependent, and upon their integrity depends what is called pelvic equilibrium.

In studying the etiology of this condition, one finds two general principles involved:

1. *Weakening of the uterine ligaments.*
2. *Weakening or injury to the pelvic floor.*

1. Weakening of the uterine ligaments may be induced by trauma or by subinvolution, tight lacing, or by the clothes binding the abdomen—too tight bandaging or prolonged dorsal decubitus after labor—in women forced to stand long periods with distended bladder, or rectum, like shop girls, in those whose occupation favors faulty posture, like stenographers or factory workers, in those with general debility or loss of tone.

These conditions put a strain upon the ligaments, resulting in their stretching, and allowing the uterus to fall backward in line with the axis of the vagina, this producing *one* of the conditions favorable to descent. True, that many stop at this point, and this class cannot be considered in the scope of this paper, but we must not be unmindful of Kelly's dictum, that retrodisplacement is the first stage of descent.

Prolapse in virgins, not explainable by any of the above causes, is usually due to congenital defects, and will be found a part of a general ptosis of the abdominal organs.

2. Weakening or injury to the pelvic floor is self-explanatory: General relaxation, the result of repeated labors with the little lacerations which escape attention at the time, plus a cervical laceration and subinvolution, tells a story with which every one is familiar. Gross laceration of the triangular ligament or the perineal body, completes the narrative.

We may repeat in brief, that the etiological factors are those which affect and disturb pelvic equilibrium, either by increasing the weight of the uterus, stretching and weakening the ligaments, or impairing the integrity of the pelvic floor.

It follows that the principle of any operative procedure for the correction of uterine prolapse must be to restore pelvic equilibrium. This involves the correction of endometritis, if present, amputation of the cervix if badly torn or elongated, or if the weight of the organ is greatly increased, reduction of the vesical hernia, and removal of the redundant mucosa of the anterior vaginal wall; repair of the levator ani and its fascia; correction of the rectocele and repair of the perineum. It also involves shortening of the over stretched ligaments or some method of fixing the uterus so that it will lie at an acute angle with the long axis of the vagina. Unless these conditions are

complied with, the result will be failure symptomatically, if not anatomically. It is assumed that other conditions such as relaxed abdominal walls, sacroiliac joint strains, etc., will be corrected.

Obviously, in selecting the method of treatment, account must be taken of the age and degree of the prolapse, and the age of the patient. In all cases, preliminary tamponade of the vagina, irrigation, attention to the elimination and general tonic treatment will not only benefit the patient, but modify our first impression of the operative indications. Preventive treatment is comprehended in the modern management of obstetric cases, and if thoroughly carried out, would lessen the frequency of this condition. We are taught that six weeks after delivery, the uterus should be involuted and in position, the vaginal canal also involuted and that if at this time there is subinvolution, whether it be due to lacerations or general bodily conditions, it should be corrected before the patient receives her discharge. This may involve treatment by tamponade and adjustment of mechanical support, or the repair of cervical, vaginal, or perineal laceration. If this is done, we have done our full duty in the prevention of this condition.

The cases which come to us in the first few months following labor, may yield very kindly to this form of treatment, but those which have persisted for a long time, and in which decensus has become permanent, or continued down into the first stage of prolapse, require in addition to these minor measures, some procedure for shortening or staying the ligaments which have become overstretched during this period.

We are familiar with the procedures of Alexander, Montgomery, Mayo, Mann, Guillian, Baldy, and others, for shortening the round ligaments; we are also familiar with the method of Polk and Bovee for shortening the uterosacral ligaments. The method of shortening the round ligaments through the vaginal incision devised by Goffe, is extremely valuable in connection with other plastic work on the vagina, especially if cystocele is to be repaired.

While the length of this paper will not permit of a discussion of the merits of these various procedures, it is true that each of these combinations has been followed by both successes and failures. One of the most satisfactory methods of shortening the round ligaments, is the method used by the Mayos.

Vaginal hysterectomy is advocated and practised by many

surgeons. It is successful in a large degree, as is also high amputation of the uterus through the abdomen and suture of the broad ligaments to the stump.

The question is, are we justified in removing the pelvic contents, except in rare cases, to relieve this condition? This operation also fails to relieve the hernia at times. It should not be done before the menopause, and even after that period, a patient suffers less if her pelvic organs are retained.

It has been noted that the age of the patient must be considered in the selection of the operative procedure. By this, of course, one means whether the woman is in the child bearing period or not. If in the child bearing period, it would seem wise to make the plastic repair that is necessary, and either shorten the round ligaments through the vagina or utilize the Mayo method. If the patient has passed the menopause a variety of methods present themselves, which promise success. The abdominal fixation as devised by Kelly, or modified by Graves, can be employed, but better than these, it would seem that the method of vaginal fixation first mentioned by Dührssen in 1890 would be the operation of election. There has been some dispute over the priority of this operation among the men whose names have been linked with it. Dührssen, Wertheim, Schauta, Watkins, Goffe, have all devised procedures which vary in technic, but are based on the same principle. The question of priority is one of interest, but of no practical value.

The points to be considered in regard to vagino-fixation are:

1. As to technic.
2. As to results.
3. Contraindications.

Preliminary, local and general treatment is of great value to the preparation of these cases for operation.

Tamponade, irrigation, correction of endometrical discharges or secretions from the vaginal or urethral glands wherever possible, will do much to favor primary union of the vaginal and perineal wounds.

As regards the last stage of preparation, that is to say, the final cleaning up—it is probable that painting the parts with Churchill's tincture of iodine will prove more efficient than routine scrubbing with soap and water.

Technic.—Following curetage, cervical repair or amputation, a transverse incision is made at the junction of the vagina and cervix, extending one-half the circumference of the cervix. A vertical

incision in the anterior vaginal wall is carried from the middle of this incision to a point just below the urethra, and the vaginal wall separated laterally by a sponge dissection for the space of one-half to three-fourth of an inch. The bladder is separated from the uterus and pushed upward by a finger covered with gauze until it disappears into the abdominal cavity through its own power of retraction. At this point, Dührssen and American operators differ, the former insists that it shall be freed up to the ureters, the latter that no fixed line should be made, but that separation should be continued until it can be pushed up easily into the abdominal cavity. Bleeding points are to be caught and tied. The single bladed speculum is then introduced to hold the bladder up and the anterior fold of the peritoneum is picked up and incised—then torn by the fingers, making a hole large enough to allow the fundus to pass through. The fundus is grasped by a volsellum forceps and pulled through into the vagina, and the cervix is pushed backward into the vagina. In this position one can inspect the appendages, remove them if necessary, can ligate and cut the Fallopian tubes, remove small fibroids of the body, or can split the uterus and remove a portion of it to reduce weight. Some operators at this point, notably Goffe, shorten the round ligaments; one is then ready to fix the uterus to the vagina. A stitch through the vaginal flap below the urethra is passed through the fundus and then through the opposite vaginal flap. Caution is to be observed that this does not bring the fundus near enough to the urethra to produce pressure. One or more similar stitches are placed and the anterior vaginal wall closed. If the cystocele is large, the flaps are trimmed off sufficiently to close without tension. If the vagina is short, it can be lengthened by sewing the transverse incision of the cervix in the same direction. If there is much oozing, it may be wise to insert a small gauze drain in the line of suture, which should be removed in twenty-four hours.

THIS COMPLETES FIXATION.

In his original communication, Dührssen advised suturing the vesical peritoneum to the posterior uterine wall, later this was abandoned, and the American operators regard it as useless.

The above technic applies to women beyond the menopause. In the other class the fixation is made at a point opposite the internal os, so as to leave the fundus free and able to rise in the abdomen in case of conception.

The next step—i.e., suturing of the levator ani and repair of the perineum, is important. Here there is greater latitude for an operator, as the principles laid down by Emmett can be carried out in a variety of ways. The suture of the torn or separated levator ani and its fascia, is the keynote of the procedure. Personally I prefer incising the junction of the mucosa and skin from the two dimples in the vulva, representing the edge of the original perineal body, dissecting the vaginal flap back and then dissecting in each lateral sulcus until the levator is exposed; the two portions of the levator ani are joined by interrupted sutures of catgut, and the body of the perineum built up to a normal degree, then the vaginal and perineal skin closed with a sub-cutaneous catgut suture. As a rule this does away with the rectocele, but occasionally one finds it best to denude the posterior vaginal wall and suture it separately.

When the sphincter is torn, it is first repaired and then the perineum is closed.

This procedure is not original, but copied from the Mayos. Most of us belong to that great class of surgeons, known as imitators, who cannot qualify as surgeons according to the standard of the "wag" who said, "a real gynecological surgeon is one who has invented an operation, either for retroversion or lacerated perineum."

The after care of these cases is simply that of ordinary plastic operations. It is better not to catheterize the bladder as the resulting cystitis may give some trouble. A very simple way of avoiding postoperative catheterization and difficulty in defecation in bed, is to have the patient accustom herself to the use of the bed pan previous to the operation, a matter of no small importance in postoperative comfort. Patient is allowed to sit up in fourteen days.

Results.—In regard to the results of this operation, as my colleague has aptly said, opinion is divided. Some operators swear by the procedure, and some swear at it, so that one must consider carefully the source of the statistics. The report from Dührssen's clinic is naturally most enthusiastic. In the *Journal of Surgery, Gynecology and Obstetrics*, May, 1907, Dührssen states that the results of his operations are exceedingly satisfactory, and in those cases where fixation has been made opposite the internal os, labor has taken place without dystocia, and somewhere he states that from 85 to 90 per cent. of these cases are cured. In consulting the literature, it is apparent that several

of our foreign friends consider themselves the author of this procedure, and their statistics are slightly at variance. In 1897 Mackenrodt reported 90 per cent. of successful cases, but he decided to abandon the operation on account of the difficulties which followed in pregnancy. Dührssen reported in 1896 twenty-eight pregnancies and seventeen normal confinements after vaginal fixation without opening the peritoneum. He also reported seventeen pregnancies where the peritoneum had been opened. One woman aborted, one case was interrupted, seven were delivered normally, and four had labor complications. At this time he reported 148 intraperitoneal fixations with one death and one relapse. He believed that dystocia was due to suturing the fundus of the uterus to the vagina, and thought it could be avoided by sewing only the peritoneum to the fundus, and the vagina to the uterus as high as the internal os.

Watkins, in May, 1909, *Journal of Surgery, Gynecology and Obstetrics*, reports the results in forty-nine cases which he has examined. In forty-two of these cases, result was perfectly satisfactory. In the same article he reports forty-eight cases from the Mayo clinic, in which the results were good in forty-seven, one case having recurrence. The general tenor of the report seems to be that about 85 per cent. of these cases will remain cured, 15 per cent. will fail, either because the uterus is too large, or atrophied, or the pelvic floor practically destroyed, or where there is an accompanying abdominal ptosis of marked degree. It is generally conceded that the operation is easily performed with very little shock to the patient and small danger of sepsis.

The appended table gives the data of the last two years experience:

Vagino-fixation has been performed only in cases of complete prolapsus at or other the menopause, with the exception of three cases, in which future pregnancy was not to be considered. In women during the child-bearing period, or in those whose pelvic supports were so thinned and atrophied that repair was impossible after methods were employed. Most of these cases report themselves cured, and vaginal examination confirms the statements. There have been exceptions, and it is from these we have learned the most.

One patient who had an unrecognized syphilis developed a slough in the anterior vaginal line of suture, and had considerable trouble before antisyphilitic treatment was instituted. Granu-

Date	Name	Age	Operation	Other operations performed at same sitting	Results	Deaths	Cause of death
10/3/09	Mrs. D.	45	Vagino-fixation.	Curettage; perineorrhaphy.....	Anatomic and symptomatic recovery.	0	
11/22/09	Mrs. P.	47	Vagino-fixation.	Curettage; rectocele; perineorrhaphy; also myomectomy. Section: Dermoid cyst of ovary size of football removed. Broad ligament attached, broken and being nourished by omentum.	Anatomic and symptomatic recovery.	0	
11/23/09	Mrs. S.	54	Vagino-fixation.	Curettage; myomectomy; perineorrhaphy.	Died 11/26/09; obstruction bowels: Abdomen opened; operation impossible.	1	Obstruction due to cancer sigmoid.
12/23/09	Mrs. M.	43	Vagino-fixation.	Curettage; perineorrhaphy; fundus adherent to sigmoid, latter freed, raw surfaces closed.	Anatomic and symptomatic recovery.	0	
1/11/10	Mrs. O.	36	Vagino-fixation.	.....	Anatomic and symptomatic recovery.	0	
1/24/10	Mrs. T.	56	Vagino-fixation.	Curettage; perineorrhaphy.....	Anatomic and symptomatic recovery.	0	
2/19/10	Mrs. C.	56	Vagino-fixation.	Curettage; amputation cervix; perineorrhaphy.	Anatomic and symptomatic recovery.	0	
4/12/10	Mrs. M.	36	Vagino-fixation.	Curettage; perineorrhaphy.....	Anterior vaginal wall became seat of slough with some infection; positive Wassermann obtained, and specific treatment instituted; wound healed and patient recovered with great relief from previous symptoms, but without relief from pelvic pressure.	0	
5/20/10	Mrs. W.	54	Vagino-fixation.	Curettage, large cystocele; perineorrhaphy.	Slight irritation of bladder for few weeks, otherwise perfect recovery.	0	
10/3/10	Mrs. K.	51	Vagino-fixation.	Curettage; perineorrhaphy; urethral caruncle removed by cauterization.	Anatomic and symptomatic recovery.	0	
10/8/10	Mrs. O.	65	Vagino-fixation.	Curettage; amputation of cervix; perineorrhaphy.	Anatomic and symptomatic recovery.	0	

Date	Name	Age	Operation	Other operations performed at same sitting	Results	Deaths	Cause of death
10/10/10	Mrs. M.	43	Vagino-fixation.	Curettage; perineorrhaphy; nephro-colopecty, Longyear.	Anatomic and symptomatic recovery.	o	
10/13/10	Mrs. D.	54	Vagino-fixation.	Curettage; perineorrhaphy	Anatomic and symptomatic recovery.	o	
11/17/10	Mrs. B.	42	Vagino-fixation.	Curettage; bilateral trachelorrhaphy; perineorrhaphy.	Anatomically good, 6/5/11 returned with irritable bladder and backache. Urine hyperacid; bladder capacity 400 c.c.; tender sacroiliac joints.	o	
11/17/10	Mrs. H.	55	Vagino-fixation.	Curettage; amputation cervix; tubes tied; perineorrhaphy.	Anatomic and symptomatic recovery.	o	
11/17/10	Mrs. L.	34	Vagino-fixation.	Curettage; repaired bilateral tear of cervix; perineorrhaphy; left inguinal hernia; Longyear nephro-colopecty.	Anatomic and symptomatic recovery.	o	
4/27/11	Mrs. W.	41	Vagino-fixation.	Curettage; perineorrhaphy	Anatomic and symptomatic recovery.	o	
5/3/11	Mrs. V.	37	Vagino-fixation.	Curettage; amputation of cervix; large cystocele; tubes tied; perineorrhaphy.	Anatomic and symptomatic recovery.	o	
5/8/11	Mrs. S.	52	Vagino-fixation.	Perineorrhaphy; extensive cystocele.	Anatomic and symptomatic recovery.	o	
.....	Mrs. Z.	.....	Vagino-fixation.	Perineorrhaphy; extensive cystocele; nephroclopecty.	Anatomic and symptomatic recovery.	o	
5/30/11	Mrs. S.	53	Vagino-fixation.	Perineorrhaphy.	Anatomic and symptomatic recovery.	o	
6/27/11	Mrs. F.	40	Vagino-fixation.	Curettage; perineorrhaphy	Anatomic and symptomatic recovery.	o	
7/31/11	Mrs. B.	46	Vagino-fixation.	Curettage; amputation cervix; perineorrhaphy.	Anatomic and symptomatic recovery.	o	
7/31/11	Mrs. B.	49	Vagino-fixation.	Curettage; resection fibroid fundus; perineorrhaphy.	Anatomic and symptomatic recovery.	o	
10/29/09	Mrs. G.	38	Vagino-fixation.	Amputation cervix.	Anatomic and symptomatic recovery.	o	

lations finally became established, and the wound healed leaving a small cystocele.

In a few cases hemastasis was not complete and a drain was left in the line of suture. Bleeding was quite profuse, and in two cases slight infection occurred, but without influencing the final result. One patient died.

Other operations were performed at the same sitting, such as resection of the fundus uteri for tumor, or subinvolution, tubes tied or removed. In one case an adherent colon was freed from the fundus uteri, and raw surface covered. In cases with cervical laceration without much subinvolution, repair was made; in those with much subinvolution, amputation was performed.

Our experience indicates that this operation should not be the one of election during the child-bearing period, nor in the very old cases with atrophy of the uterine and pelvic muscles; this class fortunately is rather rare.

In the class of cases at or beyond the menopause, with the above exception, it seems the operation of election. It appeals to the surgeon because of its simplicity, because it reproduces more nearly than any other procedure, normal pelvic equilibrium, and furthermore, a larger percentage of anatomic recoveries are obtained. It reproduces the relationship of the axes of the vagina and uterus—gives the bladder a firm support, and through the medium of the reconstructed pelvic floor, offers to intra-abdominal pressure a resistance that seems able to cope with it.

Abdominal ptoses occurring with prolapsus, have been corrected as part of the management of this unfortunate condition.

In conclusion, our experience has convinced us of the value of this method in the appropriate class of cases, and after reviewing the results from other methods of vaginal repair and intra-peritoneal shortening of ligaments, as well as vaginal hysterectomies, ventrofixation, etc., the superiority of the method is apparent.

No claim of originality accompanies this paper. Numerous authors have been quoted, and an attempt has been made to test this method impartially and report results.

PREVENTION OF SHOCK.¹

BY

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Detroit, Mich.

SIMPLICITY is what I have advocated and taught at every opportunity, for the more cumbersome and complicated our technic is, the more shock we must necessarily produce, and the more time we must consume in the operation. But time, which is very often necessary, is not the only thing. I have always claimed that the nervous condition of the patient has much to do with the production of shock.

The nervous condition brings us back to the first meeting with the patient. The tact we use, the examination, and the giving of our opinion that an operation is necessary, all have their influence for good or evil.

Some people are not afraid. They have physical courage and nothing seems to phase them. Some are very timid, and, knowing that some operation will have to be performed, live for weeks and months before they see a surgeon. With tact a great deal of this fear and dread can be eliminated. Then there are some that are such cowards that anything you can say or do makes no impression on them. Now we can readily see that the management of these patients must be entirely different. People who are not afraid can be given time before the operation and can be prepared, if such preliminary preparations are beneficial, days or weeks before.

On the other hand, those who are very timid, the longer they wait for operation, the worse they get. They think of the operation all day, dream of it at night, and get themselves in such a nervous condition that they will suffer a great deal from shock.

With this type, even if weak and run down from long continued trouble, unless there are serious contraindications, I proceed to operate immediately, that is, at least, the next day; take just enough time to make the necessary blood examination, urine analysis, clear out the bowels, etc. Give them trional or codeine at night, so that they will have sleep. The next morning they can have a little weak coffee or tea or some hot water and

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

then be prepared by the nurse. Bathe them and comb their hair and do everything that is necessary to keep them continually thinking of everything but operation.

If they are very nervous, give them $1/4$ gr. of morphine and $1/100$ of atropine as a sedative and stimulant. When the patient is ready, take her quickly to the operating-room and put under the anesthetic promptly. Sometimes the surgeon is not ready, or the operating-room nurse is not ready, and the patient is kept lying in bed thinking of the dreadful ordeal that she has to pass through. This has a serious effect on the nervous system.

I am glad that Dr. Crile has been able to demonstrate the depressing effect of worry and dread, and how necessary it is to lessen this, in the prevention of shock.

I see them putting the patient on the table and then running around looking for the anesthetic, then the instruments will rattle and there is commotion all around. Then perhaps the patient is strapped down and perhaps scrubbing and shaving has been started. Thus the poor patient will get into such a nervous condition that even the anesthetic is a dangerous thing and I believe that often the deaths during the anesthetic are produced by this psychic condition.

I have actually seen them take from thirty to thirty-five minutes from the time the patient left her room until the anesthetic was started. This, to me, is horrible.

I want to have everything ready in the operating-room, the patient is put on a stretcher, rolled quickly to the operating-room, then placed on the operating-table, and instantly, as soon as she is on the operating-table the anesthetic is started.

She has no time to think of the operation because she sees so many strange sights. If you give gas, she is under it in a few minutes. Then give the ether, and now is the time to do the extra shaving and scrubbing and put him or her in the proper position for the operation. By doing this you keep the patient under the anesthetic a little longer, but it is comparatively a few minutes and I am sure that it produces far less shock, than the mental agony to which the patient is otherwise subjected.

The physician should make as perfect and clear a diagnosis as possible and have his mind made up as to what he is going to do and how he is going to do it the night before or the morning of the operation. By this forethought and the laying out of plans, he will get all the necessary instruments and the different kinds of ligatures and everything else required to do the work.

Once in a while, he may find complications, but that will not phase him if he has had any experience. He will work fast as he knows just what to do, because he has probably anticipated the complication in his review of his diagnosis. Having thus everything ready, he should work quickly. I know that many operators say speed does not amount to much, the patients do not feel, and a little more anesthetic does not hurt. But when the operation takes two or three times as long as it ought to, it seems to me that the shock is far more serious than it should be.

The trouble with some operators is, they have not made up their mind what they are going to do. They have not laid out a clear plan or action for each individual case. They slobber through it in any kind of way. Often the assistants do most of the work. Some have too many assistants. Before the assistant can find the proper instrument, I have already used it, and as a rule, before the assistant can find the needle and sutures, I have already taken several stitches.

Thus by cultivating speed and laying out the exact plan of how you are going to operate on that patient (and every case a little different from the other), and by working quickly you shorten the operation and lessen the shock very decidedly.

By speed, I do not mean superficiality and doing things only half way and improperly. You can do things as just thoroughly when you do them quickly as when you do them slowly. When the operation is finished, I believe in the routine administration of a saline enema, or when this cannot be done, the use of saline hypodermically, say a pint under each breast, or the drop method.

It is wonderful how well these patients get along. They do not suffer from thirst. The effete material and toxins developed through fear, by the anesthetic and the shock of the operation are eliminated by the kidneys and the skin to a great extent on account of the diuretic and diaphoretic action of the saline.

Some people complain a good deal of pain after the operation and I believe that that produces shock and is depressing. Morphine is made to relieve pain so I give it in small doses, $\frac{1}{8}$ grain hypodermically. It is a dose large enough to be stimulating and large enough to relieve pain as a rule. If one dose does not relieve, I give another in an hour. If it does relieve I do not give another until the effect of the first one passes off, say four or five hours.

At night, I give $\frac{1}{4}$ grain to produce sleep and it is repeated

in exceptional cases. By keeping the patient quiet for twenty-four hours, the system has time to eliminate the anesthetic and the patient feels relieved of his or her trouble, and has little pain.

The shock and anxiety have disappeared, simply by careful management of the case. If the stomach is irritable, it is irrigated and rested.

In conclusion:

1. By simplicity and tact in management before the operation, much shock is prevented.
2. Have everything ready in the operating-room, and start the anesthetic immediately.
3. Have all necessary ligatures and instruments at hand so that there need be no delay during the operation.
4. Analyze your case thoroughly beforehand, so that you know exactly what you are going to do and how you are going to do it, and what complications may arise.
5. Give 2 quarts saline enema (or hypodermically) as soon as the operation is finished.
6. Keep the patient free from pain for twenty-four hours after the operation.

620 WOODWARD AVENUE.

THE CAUSES OF APPENDICITIS.¹

BY

G. K. DICKINSON, M. D.,

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Bayonne City Hospital,
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IN the literature on appendicitis we find various attempts to explain its causation. Man is the only animal that has ever been known to suffer from this disease. He is the only animal who makes eating a pleasure, who gormandizes and overfills the intestinal tract with high proteids and who eats more than can be digested, the undigested portions proceeding to fermentation. Red meat, rotting in the intestinal tract, is a poison, and an excellent culture medium for proteolytic germs. Physicians practising in China, where red meat is seldom eaten and where a little pork, much fish, vegetables and the coarser cereals comprise the main diet, have told us that in many thousands of patients appendicitis is rarely met. There is some con-

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

nection between gluttony and appendicitis, but there is a stronger connection between red meat diet and appendicitis.

Unfortunately, the term appendicitis has become applied to one variety only, whereas we have two—namely, the type which proceeds to the destruction of the appendix, gangrene, perforation, and regional or extending peritonitis (the type more commonly understood), and the chronic, which is sometimes hyperplastic, ending in fibrosis.

Within the last two years we have made careful observations on the cecum, the ileocecal junction, the cecoappendicular junction and the condition of the appendix. It is difficult to be positive in all cases as to whether or not the cecum is affected at the same time as the appendix. In the larger majority of highly vascularized conditions of the appendix we see similar conditions in the cecum. If there be an arborization of blood-vessels on the appendix we find the same on the cecum. In conjunction with acute appendicular conditions, the cecum often has a vascular cobweb, sometimes running up on to the ileum for an inch or more.

Subacute, also chronic appendicitis of the hyperplastic type, is very generally associated with a thick, leathery cecum up to and above the ileocecal junction.

Fibroid appendicitis, where the musculature has been disturbed, is often associated with a sclerosis of the walls of the cecum and much ballooning and pendancy.

Taking together the acute, subacute and chronic cases, we have found both sexes equally affected.

In practically every case of progressive destructive appendicitis the cecoappendicular junction is tubular, and the lymphoid tissue at the junction so swollen as to choke the aperture. Consequently, the appendix cannot drain itself. Tension results, and with tension the arteriocapillary pathology of gangrene or perforation.

In the hyperplastic and chronic types the cecoappendicular junction is embryonal, funicular. Drainage is good and tension does not occur.

If perchance there be repeated attacks of acute or subacute conditions on top of a chronic, scar tissue may form midway in the appendix, leading to a destruction of the distal portion.

The majority of males, for some philogenetic reason, have tubular cecoappendicular junctions. The majority of females have funicular junctions. This will account for the fact that

appendicitis as written in the literature is somewhat more prevalent in males, also, for the fact that the hyperplastic or chronic type, so commonly associated with cholecystitis and gastric or duodenal ulcer, is more often seen in the female.

The writers on the acute pathology of the lower abdomen describe the destructive type of appendicitis; the writers on the chronic pathology of the upper abdomen, the chronic type.

In résumé, the sequence is:

Overeating of the high proteids.

Residuum in cecum—decomposition.

Cecoappendicitis.

Cecum draining, recovers.

Appendix not draining, goes on to destruction.

Drainage insufficient, subacute appendicitis, with hyperplasia.

Drainage good, chronic appendicitis, tending to fibrosis.

280 MONTGOMERY STREET.

AN ANATOMICAL OPERATION FOR THE CURE OF CYSTOCELE.¹

BY

GEORGE R. WHITE, M. D.,
Savannah, Ga.

THE pathological conditions presented by a cystocele as given in our text books and current literature may be enumerated as follows:

1. Cystocele is due to over-stretching and thinning out of the anterior vaginal wall and other supports of the bladder which allows the bladder to descend in the form of a hernia. The condition is caused or at least increased by relaxed perineum which leaves the anterior vaginal wall unsupported.

2. The bladder is supported in part at least by its firm attachment to the uterus, and when this attachment is overstretched or broken during labor or otherwise, the bladder descends as a cystocele.

3. The bladder like the stomach and other abdominal organs is suspended by ligaments which are attached below to a relatively inelastic portion of the bladder, and above along the obliterated hypogastric arteries and the uterus.

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These three theories or combinations of them are about all we find in our everyday literature regarding the conditions present in a cystocele.

It is my belief that none of them is correct, and the unsatisfactory results obtained in the treatment of cystocele is due in a large measure to a faulty conception of its cause.

Regarding the supposed thinning out of the vaginal wall, a careful examination of this membrane will show that it is not thinned out, but it is a tough thick non-elastic membrane capable of supporting considerable weight and the abnormal condition in which it is placed causes it to hypertrophy rather than atrophy. Moreover when its natural supports are restored, as described later, it fits into the space originally occupied and there is no excess of tissue. The perineum likewise has very little to do with the formation of a cystocele since the condition is rare with complete rupture of that structure.

While the uterus and the bladder are united by a firm ligament, neither organ under normal conditions gets its support from the other as evidenced by the fact that in cases of complete hysterectomy the bladder still remains in place, and possibly stays up a little better than before. Reynolds has described some bands of muscular and fibrous tissue which run from the broad ligament to the base of the bladder and top of the vagina. When the broad ligaments retract after hysterectomy these bundles are put on the stretch and the bladder and vagina are drawn up more snugly than before. Under abnormal conditions, however, the vesico-uterine ligament comes into play. When the natural supports of the bladder have been broken away the attachment to the uterus is made use of to prevent a complete prolapse of the anterior vaginal wall and the bladder; and likewise in complete uterus prolapse, the uterus attempts to make use of the vaginal supports which are not able to stand the strain and give away with the result that a marked procidentia is always accompanied by a cystocele.

The theory of the ligamentous suspension of the bladder is based upon an entirely false conception of the principles involved. No relatively inelastic portion of the base of the bladder to which the ligaments are attached has ever been demonstrated, and if the bladder were suspended like the stomach, like that organ it would descend when full instead of ascending. Moreover it has been the experience of every operator who has cut through the anterior vaginal wall that when the patient coughs

or strains, the bladder is forced out of the vulva, even though the imaginary suspensory ligaments are left intact.

A few moments with the cadaver shows that the bladder stays in place because it rests upon a firm fibrous shelf stretched across between the pubic bones from the symphysis to the ischiadic spines, and pressure upon the bladder from above does not bring into prominence any suspensory ligaments nor even make tense the vesico-uterine attachment. By cutting through the peritoneum and pushing the bladder aside or removing it altogether, its supports come into view, which are none other than the anterior vaginal wall. This is attached by firm adhesions to the pubic bone in front and laterally to the whole length of the white line of the pelvic fascia with especially strong bundles of fibers springing from the spine of the ischium and becoming attached to both the anterior and posterior wall of the vagina. There are also muscular fibers extending up from the top of the vagina to the broad ligament which are a small factor in its support. Pressure downward upon the vaginal wall brings out all these attachments which are quite firm and resistant, but with sufficient pressure the attachments break away before the membrane ruptures or stretches out, and we get a cystocele; or if we run a knife along the white line on either side and sever the attachments to the vagina, we produce a cystocele of marked degree. If we now suture the vagina back to the white line and leave it spread across from one pubic bone to the other, normal conditions are restored and the cystocele cured. It is therefore evident that the anterior vaginal wall supports the bladder, and when a cystocele occurs it is due to this structure breaking away from the attachment to the ischiadic spines and the white line, and to remedy the condition according to anatomical principles it is necessary to restore the attachment between the lateral sulci of the vagina and the white line of the pelvic fascia. The easiest and simplest way to accomplish this is to incise the peritoneum at the side of the bladder, push the bladder aside until the white line comes into view, and then by the aid of an assistant's finger in the vagina, suture the anterior lateral side of the vagina to the white line of the pelvic fascia, and close the peritoneum; but an operation of this kind is seldom indicated. The cure of a cystocele is looked upon as a vaginal operation and perhaps had better remain such for the present, especially as it always is done in connection with a perineorrhaphy. But when the time comes our procidentia cases will be cured by restoring

or reattaching all the injured and broken structures entering into this complex condition instead of substituting new deformities or calling into service structures never designed to support the abdominal viscera and which never will do it satisfactorily. When the uterosacral and broad ligaments shall be restored with the same regard for original anatomical conditions that is accorded the pelvic fascia and levator ani muscle in the Hayd perineorrhaphy, I doubt not that the transperitoneal suture of the vagina to the white line of the pelvic fascia will form a part of the ideal operation for procidentia.

The suturing of the lateral vaginal fornices to the white line per vaginam presents some difficulties owing to the depth of the parts and the necessity of operating by the sense of touch rather than by sight, though with these exceptions the technique is not especially difficult. The incision is made in the anterior lateral fornix of the vagina as near as can be judged along the lateral edge of the bladder and extends from the level of the cervix to near the level of the internal meatus of the urethra. The bladder is separated from the vagina to a slight extent and blunt dissection is carried out toward the side of the pelvis until the finger can be placed on the uncovered ischiadic spine which is the chief landmark in the operation. Hemorrhage is not troublesome and can be controlled by sponge pressure. The sutures are all passed back of the white line by means of a Deschamps handled needle. The first one is placed just anterior to the spine and the ends drawn out through the wound. Traction on this suture brings the white line into prominence and a second and a third suture are passed back of it about half an inch apart, being always careful to clamp the ends and prevent the sutures from becoming mixed and twisted. Each end of the three or four sutures is threaded on a curved needle. One end of the suture goes through the lateral edge of the vaginal incision, the other through the median edge taking a firm hold of the vagina, when these sutures are tied snugly and the lateral fornix of the vagina is drawn up into contact with the white line. The other side is done in a similar manner and when all the sutures are tied the anterior vaginal wall stretches across from one ischiadic spine to the other. The normal shelf-like condition is reestablished, and the vagina is found to fill in the space between the pubic bones without tension. Should there be prolapse of the lower segment of the vagina the incision may be carried down alongside of the urethra and the vagina sutured to the firm

fibrous tissue of the pubic bone, restoring the original supports to this portion of the bladder.

The operation sacrifices no tissues and interferes with no other operative procedure, and in my cases, both the immediate and remote, results have been most satisfactory.

2 EAST LIBERTY STREET.

THE INFLUENCE OF THE GONOCOCCUS IN THE PUERPERIUM.¹

BY

JAMES E. KING, M. D.,

Buffalo, N. Y.

IN considering the influence of the gonococcus upon the puerperium it is necessary to bear in mind certain accepted facts concerning the germ. Its natural habitat is mucous membrane of the columnar type. One of the most important advances in our knowledge of the gonococcus, however, came when we learned that it would thrive on tissues other than mucous membrane, and in evidence of this we find the gonorrheal arthritis, endocarditis, peritonitis and finally the gonococcus septicemia. An important characteristic of these germs, which is possessed in common with many other bacteria, is the seeming variation in virulence. The typhoid and diphtheria bacilli and the pneumococcus may be harbored by their host for long periods with impunity, but these same germs, when introduced upon new soil, may follow a rapid and destructive course. The gonococcus exhibits this same varying virulence in a very marked degree as evidenced by the gleet that results in an acute infection on new soil, and the ophthalmia of the new born from a latent gonorrhea of the mother. Whether this phenomenon is to be explained as an attenuation of the germs themselves, or by an immunity acquired by the individual harboring them, is still more or less an open question. Be this as it may, this characteristic of the gonococcus must be taken into account in explaining its influence upon the puerperium. Another well recognized fact is the difficulty of detecting this germ by smear or culture method in many cases where the clinical evidence of its presence is indisputable. This is especially true in the female. So true is it that failure to find the germ, even upon repeated exami-

¹ Read before the Twenty-fourth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Louisville, Ky., September 26-28, 1911.

nation, does not disqualify the woman as a source of infection. In acute cases its detection is simple even to those of small experience, but the known fondness of these germs to linger long and tenaciously in the quiet recesses of the tubular glands, explains the frequent failure to discover them by laboratory methods in the subacute and chronic cases. These same germs under favoring conditions may spread to new areas or result in new infections.

Statistics relative to the frequency of the gonococcus in pregnancy and the puerperium will be found to vary somewhat. Leopold states that 20 per cent. of the pregnant women examined by him showed the germ. Krönig examined 179 puerperal women who presented temperature and found the gonococcus in 50, or 28 per cent. In the writer's hospital experience 25 per cent. of the women, examined either during pregnancy, the puerperium or following abortion, showed the germs. These figures, however, are no doubt too high for private practice.

The influence of the gonococcus upon the puerperium would seem to depend somewhat upon whether the infection is an old one, or one that is more or less recent. Clinically, therefore, the cases may be conveniently grouped under two heads, those in which the puerperium is complicated by a latent gonorrhea, and those in which the infection is acquired just prior to, or during pregnancy.

To appreciate the possible effects of a latent gonorrhea upon the puerperium one must bear in mind the influence that pregnancy has upon such cases. The marked congestion of the entire genital canal, the result of pregnancy, stimulates the resting germs of the cervix to greater activity and the result is often a profuse discharge that declares itself in the latter months of pregnancy. The effect of such cases upon the puerperium is neither marked or uniform. In the majority of instances the puerperal period gives no sign and is usually fever free. The observations of Steinbuchel testifies to this fact. He examined the discharge of 274 women who presented an absolutely normal puerperium and found the gonococcus in 18 per cent. Such cases are common in practice. While the majority of these patients give no clinical evidence of the gonococcus in the puerperal period, there is abundant proof that the puerperium favors extension of the germs and the development of adnexal disease later. The gonococci of a latent gonorrhea seem to possess for their host a lowered viru-

lence and as a result the pathological processes following an extension in the puerperium, are usually chronic from the start. It may mean a chronic endometritis, but more frequently it invades the tubes. In the latter case the result will be most often an adhesive salpingitis of varying degree or more rarely the formation of abscess. It is of course impossible to say just when such an invasion of the tubes takes place, but there is every reason to believe that in the great majority of instances it occurs during the six weeks of involution. Sometimes a woman may escape extension following several pregnancies only to be further invaded in a later one.

The clinical course of the latent gonorrhea in the puerperium will vary. It is seldom that the patient has the sharp attacks of an acute pelvic peritonitis. There may be pelvic pain and distress during the puerperal period, or these symptoms may not appear until the woman resumes her household duties. A profuse discharge, more or less purulent, follows the lochial flow. Frequently the pelvic manifestations are so mild that the woman does not complain, but regards her discomfort as the natural consequence of labor. Often the physician, if one is consulted, will attach but little importance to the symptoms. In the subsequent course of events a certain proportion of the women will entirely recover from all the symptoms and the only evidence of their disease will be the occluded tubes. Such cases constitute the majority of instances of "one child sterility." Another proportion will not recover, but will serve to recruit the great army of pelvic invalids and neurasthenics which fill the gynecological wards of our hospitals, or drag out a miserable existence in the home. The importance of latent gonorrhea in the puerperium is being better recognized and more careful observation is demonstrating that morbidity taking its origin during the puerperal period is not always indicated or measured by temperature.

A case of some interest, illustrating certain phases of the latent gonococcus in the puerperium, occurred in the writer's service of the County Hospital.

CASE I.—Mrs. B. aged thirty-one was married in 1904. Three months before her marriage she had a clear cut gonorrheal infection, at which time a vulvovaginal abscess formed and was opened. A little over a year later, in 1905, her first child was born after an uneventful labor. A normal puerperium and perfect health followed this labor. In 1906 a second child was born followed by a normal convalescence and good health. A third

child was born in 1909. Three or four days after this labor she had pain across the lower abdomen and in the sides, which her physician told her were "after pains." She resumed her household duties, however, after three weeks, although the pain persisted more or less, at times being quite severe. This condition existed for nearly a year until September, 1910, when she had an acute attack of pelvic peritonitis, since which, until her operation some two months later, she was confined to her bed most of the time. At operation the still suppurating sac of the old vulvovaginal abscess was excised. On the right side the ovary and a suppurating tube were removed and upon the left a much swollen, occluded and adherent tube was found. Some of the adhesions were recent and others quite dense and it is probable that in September, at the time of her acute attack, suppuration occurred in a chronic tubal condition that took its origin during the puerperium of the last labor.

Passing now to the cases of more recent gonorrheal infections, occurring just prior to, or during pregnancy, we find that the effects upon the puerperium are often more marked. We are dealing with an infection occurring at a time when the tissues are in a state of congestion, affording a most favorable field for the rapid spread and growth of the germs. As a rule the later in pregnancy the infection occurs, the more virulent it is apt to be.

The influence of this class of cases upon the puerperium presents two features for consideration. One is the influence of the discharge itself in favoring other infections during the puerperium, and the other the further invasion of the gonococcus.

The influence of recent gonococcus infections in promoting other forms of sepsis during the puerperium has long been recognized. The bactericidal property of the normal healthy vaginal secretion is a fact of paramount importance in the prophylaxis of puerperal infections. The effect of a recent gonorrheal infection is to so change the character of the normal secretion, that germs of almost any variety will grow and thrive, and examination of such a discharge will show it teeming with bacteria. Under such circumstances it is clear that examination or instrumentation during labor, may result in some one of the usual forms of sepsis. Such cases are dangerous and should be regarded as a menace.

The lesions produced during the puerperium by the recent gonorrheal infections are less marked and less frequent than might reasonably be expected. Occasionally a pus tube or ovarian abscess will develop during the puerperal period, but usually it is later that the pus makes its appearance. An abscess may

develop during pregnancy without interrupting it, but during the labor or puerperium such an abscess may rupture, causing fatal peritonitis. Davis, of Philadelphia, mentions two such cases. In this connection a case on the writer's service of the General Hospital is illustrative.

CASE II.—A young woman aged twenty entered the hospital complaining of severe pelvic pain and a profuse purulent discharge. These symptoms had existed for about seven weeks. In the early part of the attack she had had dysuria. The discharge showed the gonococcus in large numbers. Examination through a rather stout abdomen gave rise to so much pain that it was impossible to satisfactorily map out the pelvic organs, but suppuration of the right adnexa was pretty evident. Under anesthesia the uterus was discovered to be considerably enlarged. Curettage brought away an unsuspected seven-week conception. The abdomen was then opened and a suppurating tube of the right and a much swollen, adherent tube of the left side removed. Questioning this patient brought out no evidence of a long standing gonorrhea. Two months before her entrance to the hospital, however, she had had several exposures to what, she later learned, was an infected source. It was clear that her infection took place about the time she became pregnant.

It is interesting to speculate as to the possibility of the gonococcus being carried directly to the tubes with the migration of the spermatozoa that resulted in her pregnancy. It would scarcely seem possible that pregnancy in this case could have proceeded to full term, but it demonstrates the possibilities where the abscess is of less rapid development.

A far more uncommon manifestation of the gonococcus in the puerperium, is the septicemia. One such case has come under the writer's observation. The woman was seen in consultation and many of the details of the case are not at hand. It was determined without doubt that the husband had communicated the infection to his wife during her pregnancy. The first symptoms of a postpartum infection appeared a week after a perfectly normal labor. I saw the case one week later. There were no abdominal symptoms. A profuse vaginal discharge contained many gonococci. The blood showed the same germ in pure culture. The temperature ranged high from the first and reached 106 several times before death. It is an interesting question as to how the germ reaches the blood, whether through a wound or by way of the peritoneum and lymphatics.

In this connection the investigations of Lofaro are of interest. In a study of the blood of patients suffering from the various

forms of gonorrheal infection, he found the gonococcus in a large percentage of the cases. In the cases classed as "vulvitis and vaginitis" the germs were found in the blood in 50 per cent. In the different forms of gonorrhea in the male the percentages were still higher.

The diagnosis of puerperal gonorrhea can only be made with certainty by discovering the germs in the discharges. It must be borne in mind that such search is seldom successful during the bloody lochia. In infections of this kind, however, the character of the lochia changes in from five to seven days to the purulent type and then the germs upon careful search may be found. In doubtful cases cultural methods by a competent bacteriologist should be employed. In the presence of a mixed infection presenting the streptococcus the symptoms of infection if present, will in the vast majority of cases, be due to the streptococcus and not the gonococcus.

So far as the diagnosis from the signs and symptoms is concerned, without the detection of the germs it can only be presumptive. The temperature, as shown by Stone and McDonald in a very interesting study of seventeen cases, follows no distinctive curve, time of appearance or duration. The large majority of cases are not indicated by temperature, but its presence will usually be some indication of the severity of the invasion.

1248 MAIN STREET.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of October 10, 1911.

The Vice-President, WILLIAM E. STUDDIFORD, M. D., in the Chair.

HIRAM N. VINEBERG reported a case of

CHORIOEPITHELIOMA FOLLOWING AN EARLY ABORTION.

Mrs. A. H., age thirty-three years; married ten years; five children; last child twenty-one months old; no miscarriages, excepting the one of recent date.

Admitted to Mt. Sinai Hospital June 12, 1911.

Three months before instead of her normal menstruation, lasting seven days she merely spotted for a couple of days. At the next menstrual period the same thing occurred—merely

spotting for a few days. Four weeks later she had a very profuse uterine flow with considerable pain in the right iliac region. She was then admitted into the Lying-in Hospital where she was curetted. For the four following weeks, prior to her admission into Mt. Sinai Hospital, she had rather profuse bleeding every other day and the pain in the right iliac region persisted. On admission, her general condition was good. On bimanual examination, the uterus was found slightly enlarged with a deep tear in the left side of the cervix, the cervix was closed. The adnexa were not enlarged. A tentative diagnosis of chorio-epithelioma was made and it was decided to test the diagnosis by a preliminary curettage. The material obtained by the curette was not characteristic and it was decided to split the cervix anteriorly so as to explore the uterine cavity with the finger or to anteverte the uterus through an anterior vaginal incision for the purpose of visual inspection before resorting to hysterectomy. The latter course was adopted, and a very instructive picture was obtained. In the anterior wall of the uterus, near the left tubal insertion was a small globular projection, about the size of a small marble, of a deep bluish color, with a very thin covering which was almost translucent. It looked very much like a medium sized grape projecting through the wall of the uterus. There was no further doubt of the diagnosis, and the operation was now extended so as to remove the uterus and adnexa. The uterus, on being cut open, showed a growth the size of an almond, in the left cornua. This growth had penetrated through the entire uterine wall and produced the projection on the anterior wall above described. A microscopic examination confirmed the clinical diagnosis of chorio-epithelioma. The patient made a rapid recovery and was discharged from the hospital on the fifteenth day after operation.

DR. VINEBERG also reported a case of

CARCINOMA OF THE LEFT OVARY THIRTEEN YEARS AFTER REMOVAL OF THE RIGHT OVARY FOR A SOLID CARCINOMATOUS GROWTH.

In August, 1898, I operated upon Miss A. T., aged seventeen years, for a large solid ovarian tumor, which weighed 7 1/2 pounds, and which proved to be a solid carcinomatous growth. The left ovary presented a small cyst, size of an almond at the outer pole. This was excised and the wound sutured with fine catgut. The patient made a good recovery.

August 15, 1911, after the lapse of thirteen years, I was called to see the patient in consultation. I learned she had married eleven years ago and had a girl ten years of age. Four years ago, she had a miscarriage at the fifth month. Apart from this she had been in good health until two weeks ago, when she was seized with severe pain in the right side of abdomen and ran a temperature of 101° to 102°. She was told she had appendicitis. At my visit, I found her in bed and the abdomen dis-

tended to the size of pregnancy at about the seventh month, by a cystic tumor which was smooth. On vaginal examination, Douglas culdesac was found filled by a cystic mass. I feared a recurrent carcinomatous growth, probably of a non-operative nature but decided to give the patient the benefit of the doubt, and to do an exploratory laparotomy. She was accordingly admitted into Mt. Sinai Hospital August 16, and was subjected to an operation two days later.

The tumor proved to be, apparently, a simple unilocular cyst with few or no adhesions. I enlarged the abdominal incision so that I could deliver it entire, which I did and ablated the tumor, unruptured, in the usual way. The cyst was filled with pseudomucinous fluid and the inner wall presented, at a certain area, a small solid growth, the size of a mandarin orange. This, on microscopic examination, proved to be an adenocarcinoma.

The patient made a rapid and satisfactory recovery.

The case is worthy of record, on account of (1) the long immunity (thirteen years) after so extensive a carcinomatous growth of the one ovary; (2) the activity of the reproductive organs in the interval; (3) the sudden onset of the symptoms; (4) the persistence of the menstrual function regularly up to the time of the operation, her last regular menstrual flow occurring two weeks before.

DR. HERMAN GRAD reported the following case

PELVIC ABSCESS AND A GANGRENOUS SUBMUCOUS FIBROID.

On September 11, 1910, I saw a patient whose attending physician gave the following history. He had been attending the case for ten days. There had been a constant rise of temperature with considerable fluctuating. The patient was brought home from the country with a diagnosis of typhoid. A Diazo reaction proved negative. The patient had several chills and developed pain in the abdomen, which led to an examination of the abdomen and pelvis. A diagnosis of suppurative disease of the pelvic organs was made. From the patient a very meager history could be obtained, because she was very ill and very deaf. From relatives it was ascertained that the patient was thirty-six years old and married fifteen years; never bore any children; was pregnant once eight years ago, when she miscarried at two months. Five years ago she had an attack of abdominal trouble, which kept her in bed several weeks. Diagnosis unknown. The patient has not been well for five years. It is not known what caused the present acute attack.

Patient pale, extremely emaciated, cheeks sunken, facial expression that of a woman in the last stages of consumption. There was no history of coughing and a careful examination of the lung failed to reveal anything abnormal. Her temperature was 103° F., pulse 120, respiration 24. Complained of pain in the lower part of abdomen, where on palpation a tender mass was revealed, reaching half way up the umbilicus. Bimanual

examination showed a full pelvis; Douglas pouch obliterated; cervix drawn up; fundus of uterus cannot be outlined; whole mass immovable and painful to the touch. Rectal palpation, also, showed the true pelvis full. A diagnosis of pelvic abscess was made and the patient transferred to the hospital. The leukocyte count was 17,000 and a polymorphonuclear of 84 per cent., hemoglobin 70. The patient was in an extremely debilitated condition. It was evident that she could stand an operation very poorly. A rapid evacuation of the pus by posterior section was decided on. One hour before the time of the operation she was given, hypodermically, $1/200$ grain of hyoscine hydrobromide, $1/8$ grain of morphine hydrobromide. When the time for operation arrived it was found that the respiration had dropped to 15, pulse 106, and the patient was sleeping lightly, but could be aroused very readily. A very small quantity of ether inhalation anesthetized her sufficiently for a posterior vaginal section. The vagina was freely incised back of the cervix and a large quantity of fetid pus evacuated. With the finger in the pelvis two masses could be felt behind the uterus; these were freely invaded and broken down. A rubber drainage tube was then inserted and the patient returned to bed. The anesthetic was borne well by the patient; it seemed, to me, very much better than if she had taken a straight anesthetic. There was a gradual fall in the temperature and by the sixth day it reached the normal point. The pain subsided and a great improvement in the general condition of the patient was discernible. Bowels moved regularly; sleep returned; appetite improved and the discharge from the wound greatly diminished. In spite of the great improvement in the subjective and objective symptoms of the patient, she began to complain of pain in the abdomen. These attacks of pain lasting from one to two hours at the time. At first they were mild, but gradually grew so severe that a hypo. of morphine had to be administered. A very careful bimanual examination failed to disclose the cause of these attacks of pain. The mass in the pelvis had greatly diminished; uterus felt somewhat enlarged; the culdesac was thoroughly open, but with greatly diminished discharge. On the following day a bimanual examination showed nothing new except that the cervix felt a little larger than at a previous examination. Inspection showed something of a grayish color visible through the os of the cervix. At first it looked like a plug of tough mucus. Hooking a tenaculum into this mass it proved to be solid and I was able to remove a small piece for examination. It proved to be necrosed fibrous tissue. The following day, under ether anesthesia, preceded by hyoscine and morphine, the cervix was split open in the median line anteriorly, exposing a necrosed submucous intra-uterine fibroid the size of a hen's egg, attached by a broad pedicle to the uterus. The pedicle was put on stretch and removed as close to the base as possible. The uterine cavity was packed with gauze and the cervix sewed up. The recovery was prompt

and the patient experienced no further pain. There was no rise of temperature and the patient was out of bed in a few days.

The case is of interest because of the associated pathologic condition of pelvic abscess and necrosed intrauterine fibroid, which at first escaped detection. From the history of the case I believe that the necrosis of the fibroid was a later development and not a causative factor in the development of the pelvic abscess.

DR. HENRY DAWSON FURNISS reported a case of

TUBERCULOSIS OF THE KIDNEY.

Mrs. W. E. B., nurse, married six weeks, says that eight years ago she caught cold, and then had a severe cystitis that lasted six weeks. Following this she had some frequency of urination. In the fall of 1908 she had bloody urine for two days. In the fall of 1909 went to pieces from overwork and a continuance of her bladder disturbance. The urine examined at this time showed pus, some blood, and a few casts. Claims that a month later examination showed urine free of pus. She was voiding every one or two hours, and was fairly comfortable until the spring of 1911. Since then the bladder has been much more troublesome; voids every five to ten minutes during the day and gets up nights from five to twenty times. Has lost some weight. She found that half grain doses of calomel, taken once every one or two weeks gave her much relief from cystitic symptoms.

This patient recently consulted Dr. C. C. Guion of New Rochelle, who found tubercle bacilli in the urine. He made a diagnosis of tuberculosis of the right kidney and sent her to me for examination in regard to left. Cystoscopy showed infiltration, but no ulceration around the right ureteral orifice, the rest of the bladder in very good condition, and a normal left ureteric orifice. Urine from the left side per catheter was normal.

By vaginal examination a thickened tender ureter could easily be felt. This is almost constant in cases of any duration.

No evidence of pulmonary tuberculosis.

The last of June I removed her kidney under gas-oxygen anesthesia. The ureter was divided near the bladder with a cautery, a separate incision parallel to Poupart's ligament having been made for this purpose. Layer closure of wounds with catgut; drainage for twenty-four hours. Within a few hours after the operation her temperature rose to 101, and later to 102. It remained high for four days, and then fell to normal. Wounds closed by primary union. Over a month later some serum came from the lower wound; looked very much like a water blister. A few weeks ago the same thing happened with the upper near its posterior end. The patient has gained weight and strength, and now the bladder troubles her very little. Gets up at night three to five times, and holds the urine during the day for two hours.

As seen in the specimen, there is only a very small part of the

kidney near the lower pole not destroyed by the tuberculous process.

DR. FURNISS also reported a case of

HYPERNEPHROMA.

Mrs. K. McG., forty-nine years old. The mother of fourteen children. Normal labors. In good health until January of this year when she had suddenly severe pain in the right lumbar region. This lasted, though not so severe, for eight weeks; worse upon exertion. Lost eight pounds in January and February, but none since then. Came into the Post-graduate Hospital on Dr. Quintard's service July 7. At this time a mass was found in the right hypochondriac region, that moved with respiration; the mass extended inward as far as the navel, and downward to the iliac crest. The colon was inflated, and upon percussion there was then tympany in front of the mass.

The urine was free of blood until July 14, when I first saw her. At that time the urine contained a large amount of blood, which came from the right kidney. To corroborate the diagnosis of a renal growth, argyrol was injected into the renal pelvis and a radiograph made. In this radiograph one can see a marked distortion of the renal pelvis. The ureter is seen running up alongside of the spine, hidden mostly by the transverse processes of the vertebræ, then running off at right angles to the right for a considerable distance (2 1/2 inches). Below this is a downward shadow.

July 18, nephrectomy under gas-oxygen anesthesia. After the recovery from the initial shock the convalescence was uneventful.

Examination of the growth shows the greater portion of the kidney perched on top of the tumor mass. One calyx extends outward just as shown in the radiograph. Below the kidney is seen a large tumor which is composed of two principal parts; an upper yellow, somewhat lobulated, with a lower colloid mass. Around this colloid mass can be seen some of the yellow growth. Microscopical diagnosis by Dr. Nillman of the Post-graduate Hospital: Hypernephroma, with colloid degeneration.

DR. BOLDT reported a case where

UTERUS AND VAGINA WERE REMOVED BY PANHYSTEROCOLPECTOMY FOR COMPLETE PROCIDENTIA OF THE ORGANS.

The patient in this instance is fifty-seven years old and had been troubled with the prolapsus a number of years without getting any relief from the use of supporters.

One may say that such operation is unjustifiable; that a plastic operation may be done which will give relief. To this I answer, that the best proof that no operation has been devised that will positively cure a patient of prolapsus, except the one which was done in this instance, is that such a large number of operators have devised and described operations for prolapsus.

Calpohysterectomy is the only operation which guarantees a cure of permanence.

Certainly one should never undertake it without placing before those concerned, the objectionable feature, namely, impossibility of future sexual intercourse.

I do not consider the operation at all serious, indeed a patient, if the conditions are very favorable, may be up and about on the following day. As a matter of fact, in one instance the woman resumed her vocation as a cook within a week after the genital tract had been obliterated by this operation.

DR. LEROY BROWN reported several cases

CASE I. TUBERCULAR KIDNEY AND URETER.

Mrs. A. C., age thirty-six, married, five children, was admitted to my service, in the Woman's Hospital, with a history of having, for the previous eight months, the symptoms attendant upon a severe laceration of the perineum and cervix, and also a history of at times having a frequency of urination. When under the anesthetic, the regular catheterization (which is done in this hospital, just before the operation) withdrew several ounces of urine heavily charged with blood. The cystoscopic examination at the time yielded no positive information on account of the difficulty of cleaning the bladder. She was returned to her bed for further investigation. A few days later the cystoscopist of the hospital catheterized the right ureter the mouth of which was patulous; he failed to catheterize the left on account of the difficulty in locating the mouth of the ureter in the inflamed area. His report was as follows: Bladder washes clear with difficulty. The mucous membrane of the bladder is of a dark deep purplish red, and edematous, especially at the entrance. Acute cystitis present, especially marked on the anterior bladder wall, above the bladder-entrance, also upon the left side and on the trigone. Areas presented appearance of elevated edematous patches with here and there submucous extravasation, but no ulceration seen. Left ureter mouth is a slit in the midst of an area of acute edematous inflammation. Right ureter patulous and easily catheterized. Urine was obtained from both ureters, the culture from which showed no tubercle bacilli. On June 5, guinea-pigs were inoculated, and on June 19, the postmortem of these pigs showed the following: First pig inoculated with urine from left ureter showed acute suppuration of inguinal lymph nodes, also fatty changes and congestion in the pancreas; nothing to indicate tuberculosis. Second pig inoculated from the urine of the right kidney showed areas of necrosis in inguinal nodes but no sign of tuberculosis. Third pig inoculated with urine from bladder showed areas of necrosis in inguinal glands, and congestion of spleen. Finally, smear of all of the caseous nodes of these pigs failed to show tubercle bacilli. During this time, the patient was sent to the country for the purpose of building her up. Not being satisfied with the result of the finding, in the guinea-

pig inoculation the patient was brought back to the hospital, and further studies made. No enlargement of the kidney could be made out by palpation; nor was there any tenderness over the kidney, but the constant vaginal pain, and cystitis had persisted. On August 29 an examination of the urine from each kidney, showed the right kidney was healthy, and for the *first time*, the presence of tubercle bacilli in the left kidney. A few days later the left kidney was removed by Dr. R. M. Rawls, assistant surgeon on my division, in charge of the summer service. The kidney was removed through the lumbar incision; the ureter was separated as far as possible through this incision, a second incision was made through a median line, and the ureter was separated to its entrance in the vagina. It was then removed by being withdrawn through the lumbar incision; a small gauze drainage was introduced through the vagina, and also in the lumbar incision. The patient made an even recovery with the exception of a tubercular sinus still existing in the lumbar incision caused by a contamination at the time of separating the kidney from the ureter. I report this case on account of the unusual thickening of the ureter, and also chiefly on account of the difficulty of making a definite diagnosis, in spite of the systematic efforts.

CASE II. CHRONIC OBLITERATIVE APPENDICITIS, WITH CYST INVOLVING 1 CM. OF THE TIP.

Miss E. F., age twenty-six, was admitted to my service at the Woman's Hospital for retroversion and obstinate constipation. The abdomen on being opened revealed a remarkably redundant, and dilated sigmoid, together with a retroverted uterus. Not having prepared the patient for the possibility of an intestinal operation, I felt only justified in suspending the sigmoid to the abdominal wall, the displaced uterus was also replaced by operation. The appendix was examined as is my routine custom; it was free of adhesions and macroscopically gave the appearance of a small appendix having 1 cm. of its tip involved with what appeared to be carcinoma. The part involved was indurated, irregular in shape, and of a congested appearance. The pathological report is as follows: Appendix 7 cm. long and about 1/2 cm. in diameter; near the tip is a small dilation of the lumen forming a cyst beneath the serosa, the appearance is not that of new growth. The cyst lining is continuous with that of the appendix, and there is some increase of connective tissue.

CASE III. LARGE CORPUS-LUTEUM CYST FOLLOWING, SIX MONTHS LATER, A RESECTION OF THE TUBE ON THE SAME SIDE FOR ECTOPIC PREGNANCY.

Mrs. C. K., age twenty-eight, married, no children, no miscarriages, admitted to my service at the Woman's Hospital on February 5, for an unruptured tubal pregnancy of the right side.

The condition, on exploration was an enlargement of the right tube in its middle third; there were no adhesions about the tube. The ovary of the affected side was to all appearance healthy. The tube was therefore resected, and the ovary was conserved. The recovery was smooth. June 12, the patient visited me in my office, complaining of severe pelvic pain. The examination gave a large cystic mass in the pelvis. She was returned to the hospital, and the abdomen reopened on the fifteenth. It contained a corpus-luteum cyst of fully a liter capacity of the ovary that had been conserved. The intestines were densely adherent to the cyst wall. All of the cyst wall could not be removed on account of its friable condition. A pelvic drain was introduced through the vagina. The operation was one of unusual difficulty and of grave danger to the patient; she, however, made an uneventful recovery, and today the pelvis is clear. The ovary was saved in the interest of what we regard as conservatism. In view of the possibility of being forced to subject a patient to such a severe second operation, on account of a disturbance that may arise in the circulation of an ovary that we attempt to save, I can hardly feel that such conservatism is justifiable, provided the other ovary and tube are healthy.

This case is simply an example of what has occurred to every operator more than once.

The point I wish to make is that while I think it to be our duty to preserve all parts that are healthy, it is equally our duty not to run the risk of subjecting a patient to the possibility of what may be a severe second operation in our efforts at conservatism, and I am becoming firmly convinced that in such cases, the patient herself should, before the operation, be given the privilege of choice, and that she should be told, that while in the majority of instances, the conserved parts behave kindly, yet occasionally they give trouble, and second operations are required. The patients should be allowed to exercise a choice in the matter, and we should not assume all the responsibility, which we do by not consulting them.

CASE IV. ACUTE DILATION OF THE STOMACH FOLLOWING HYSTERECTOMY FOR DOUBLE PYOSALPINX.

Mrs. E. V. entered my service at the Woman's Hospital on March 3, with the following history: Thirty-six years old, married, seven children, and no miscarriages. The patient was delivered on January 25, normal confinement; she remained in bed two weeks, was out of bed a few days and returned to bed on account of pelvic pain. She remained in her bed for the month previous to entering the hospital. Her condition was most unpromising from a surgical standpoint, she was emaciated, but had no temperature. The differential blood count showed 15,000 leukocytes, 75 per cent. polynuclear, and 60 per cent, hemoglobin. She was kept in hospital six days for study before operation;

during this time the Von Pirquet vaccination proved negative, and the culture from the urine showed no colon bacilli, but an abundance of staphylococci which evidently was a contamination. The supravaginal hysterectomy was done on the ninth, drainage introduced through the split cervix, into the vagina, and the patient put to bed in as good condition as could be expected under the circumstances. During the following two days there was marked abdominal distention attended by frequent vomiting. At the time no special importance was attached to this, the patient passing an abundance of urine, and having no temperature above 100°. On the third day the distention became much more marked, the abdomen being tense, and the vomiting became incessant, the pulse rose to 140. There was nothing to indicate peritonitis, the urine being abundant and the facial expression not of the typical character. Acute dilation of the stomach was then recognized and treatment instituted accordingly. The stomach was washed every four hours, feeding by rectum and not by mouth, and the patient was held in the knee chest position for one hour out of every two. Strychnia was given almost to physiological limit. The patient improved after each washing, and the vomiting rapidly diminished. This treatment was continued, the intervals in the knee chest position as also that of the stomach washing were gradually made longer, as the patient slowly improved from day to day. After eight days the bowels moved for the first time. During the treatment, at various times, efforts were made to move the bowels by leaving in the stomach 2 ounces of castor oil at the close of the washing, but without any effect, the oil being returned with a subsequent washing, if it was not vomited up. Though the patient was out of danger at the end of eight days, yet great care had to be exercised in feeding, since the smallest liberties showed a tendency to a return of the dilation, with vomiting.

Meeting of November 14, 1911.

The President, WILLIAM E. STUDDIFORD, M. D., in the Chair.

DR. J. BRETTAUER reported a case of

“POSTOPERATIVE TETANUS.”

R. W., Hospital No. 125,647, age forty-one, was admitted to my service at Mt. Sinai Hospital on October 4. On October 6, she was operated upon for multiple fibroids of the uterus. Supravaginal amputation, with removal of both appendages was quickly performed and all stumps were covered with peritoneum. The appendix, whose tip was adherent to the parietal peritoneum, was ligated off and the stump cauterized with carbolic acid, a method which I have used extensively during the past ten years.

The Mount Sinai Hospital

No. 125647

Bed 3

Rosie Weinberg

Wood V.

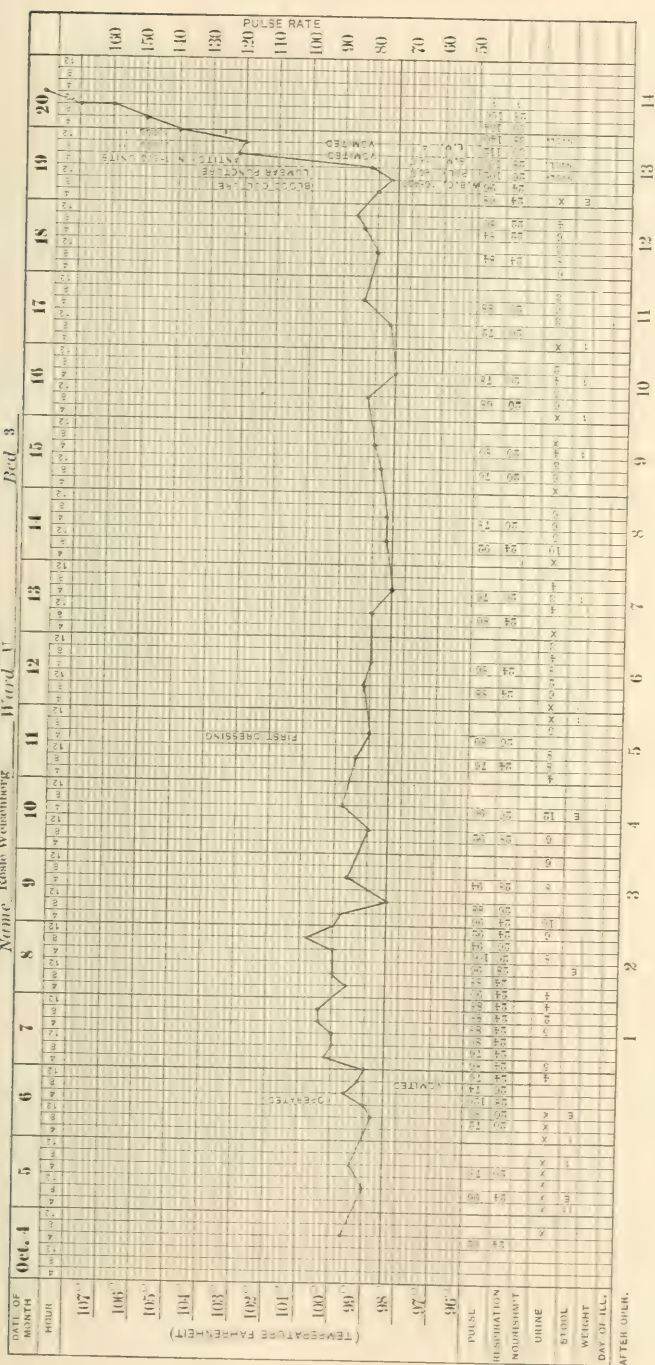


FIG. 1.
POST OPERATIVE TETANUS

The entire operation was typical and of short duration. Convalescence was absolutely uninterrupted. A slight rise of temperature which occurred on the second day, dropped to normal immediately after a low enema and the disappearance of a slight meteorism.

On October 11, the first dressing showed primary union. On October 18, the patient was out of bed in the morning, but did not rise in the afternoon as she complained of nausea and slight headache. On evening rounds the house surgeon noticed slight trismus, which increased to such an extent that by the following morning the patient was unable to open her mouth more than one-eighth of an inch.

Opisthotonus was present to a very slight degree. Knee jerks on both sides were exaggerated. No Babinski or Oppenheim signs were present. The temperature was normal, pulse 98. The blood count showed 10,400 W. B. C., 80 per cent. polynuclears, 16 per cent. S. M. and 4 per cent. L. M. The fluid extracted from the spinal canal by lumbar puncture was perfectly clear.

One thousand units of antitoxin, procured from the city Board of Health, were injected intraspinally.

At 3 P. M. the fingers of both hands twitched slightly, the patient was restless and complained of severe headache.

Two thousand units were injected subcutaneously.

On October 20, at 3 A. M., the patient was very restless, dyspneic and cyanotic. Temperature had risen steadily to 106, trismus complete, no neck symptoms. At 9 A. M. the patient died, her temperature reaching 109.

The history of this case is incomplete, no autopsy being obtainable. A blood culture and the serum aspirated from the spinal canal were both negative.

This is the first case of postoperative tetanus which I have seen, and of course I am extremely anxious to find the etiological factor responsible for the infection. There are cases reported in which the catgut used was said to contain the tetanus spores, others in which, indirectly at least, some connection with another tetanus case could be established.

In this instance no such connection can possibly be found. There has not been a case of postoperative tetanus in Mt. Sinai Hospital since it was opened to the public. The catgut used was prepared exactly as usual; it was used by me and by several others on the same day in other cases: therefore the catgut theory does not seem to me to be a very plausible one.

It is well-known that tetanus bacilli are found in the contents of the normal intestine. It is therefore not a mere speculation, but rather a permissible assumption to ascribe the cause of this infection to an invasion of the blood by tetanus bacilli, through the appendix stump.

This case is similar to most of the others reported, as far as its late development after operation and its rapid course is concerned.

Dr. J. BRETTAUER also presented a case of

"PERFORATION OF THE POSTERIOR LIP OF THE CERVIX."

The patient, age thirty-two, has had four children, all normal labors as far as can be ascertained. These labors were preceded by a miscarriage in the fifth month, which required no interference. The youngest child is two and one-half years old.

She consulted a physician recently for a persistent mucopurulent discharge and was told that she suffered from cancer of the cervix and required immediate operation.

On digital examination a condition was felt which was rather puzzling until the introduction of a speculum revealed the true state of affairs. The accompanying cut reproduces the

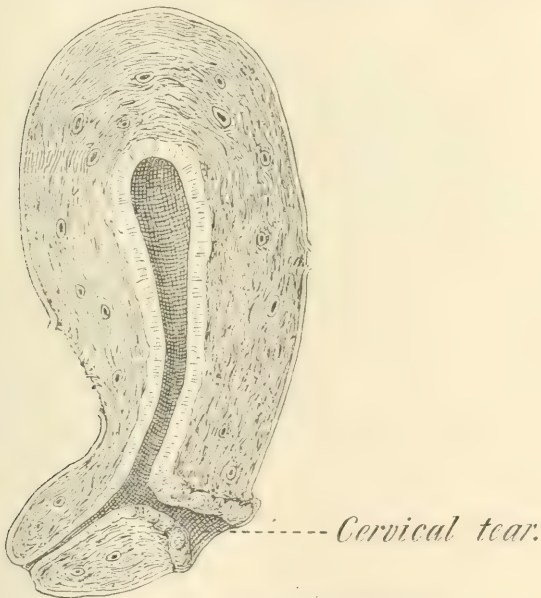


FIG. 2.—Schematic Median Section.

condition better than I could describe it. There was a small, soft, virginal cervix, with a perfectly normal external orifice pointing upward toward the symphysis. About one-half inch behind this orifice an area was felt and seen which corresponded to the usual irregular, stellate laceration of the cervix, with everted, hypertrophied and hyperemic, but perfectly soft mucous membrane. In the center was an opening which allowed the introduction of a sound in nearly a straight line, into a somewhat enlarged but freely movable uterus. A sound introduced into the first mentioned orifice (the virginal os), after passing through the very thin layer of the posterior lip for about one-half inch, became visible in the posterior opening.

In the absence of any history of interference, instrumental or otherwise, during labor or at any other time, it would seem to me that the explanation of this condition would primarily depend upon an insufficient development of a congenitally elongated cervix. At the time of her first pregnancy, with a probable prolonged pressure of the head located in the pelvis during the last month, an already thin posterior cervical wall became thinner during the first stage of labor and instead of retracting and dilating, a direct rupture resulted, through which this and subsequent children were born.

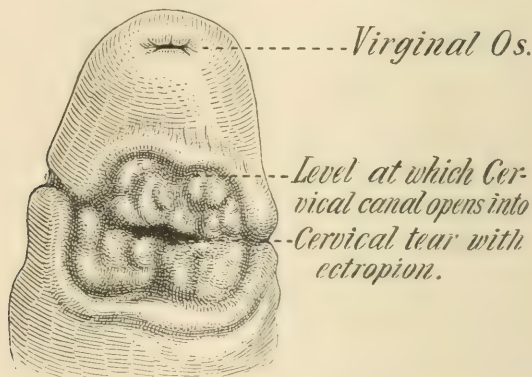


FIG. 3.—Posterior View; Curvix Pulled Upwards.

The correction of this condition was very simple and after the amputation of the existing small cervix, the procedure was the same as would be employed in any ordinary amputation of the cervix.

DISCUSSION.

DR. HERMAN J. BOLDT said that while Dr. Brettauer said that he thought the infection occurred through the appendicular stump, nothing was shown to lead one to consider that that assumption is correct. Dr. Boldt had had two patients with tetanus. The first was an operation for a large ovarian tumor with appendectomy; and the other a supravaginal hysterectomy for a myofibroma with appendectomy. In both cases the appendix had been inverted. In the first instance the patient was to be sent home on the following day, the wound having healed by primary union, and the patient seemed to be in perfect condition; when on the twelfth day she complained of a sore throat and some difficulty when swallowing. Because of this, she was kept in the hospital. That she had the beginning of tetanus was not recognized until after the lapse of about forty hours, from the time of the beginning of the first symptom.

In the second case, Dr. Boldt made the correct diagnosis

within two hours from the beginning of the first symptom, but, though treatment was promptly begun, the patient also succumbed. Union of the wound was primary in this instance, too.

The most painstaking search for the cause of the disease, failed to reveal its source.

Some months previously a patient died in the hospital of tetanus, caused by traumatism.

Dr. WM. E. STUDDIFORD said that Dr. Brettauer had spoken of the stump of the appendix as being the source of infection. In Dr. Coe's service one year ago last summer there occurred a case, the counterpart of the one reported by Dr. Brettauer. This patient was operated on for uterine fibroids; at the same time the appendix was removed; eleven days after operation when the patient was apparently convalescent, tetanus developed and this patient died. An autopsy was performed and the bowel and abdominal wound were removed for examination. There were some adhesions about the appendicular stump and one or two drops of serum about its end. This was cultured and injected into guinea pigs by Dr. Norris with negative results. Cultures too were made from the abdominal scar and with negative results.

Dr. CHARLES NORRIS remembered the case referred to by Dr. Studdiford. It was a well known fact that tetanus would not result, or was not likely to result, from stitch wounds unless there was some suppurative process about the sutures. In other words the organism seemed to be overcome by phagocytosis. But when the tetanus bacilli were present and accompanied with some suppurative organism then tetanus was likely to develop, and this was especially true when there was present staphylococci. This organism seemed to give the tetanus bacilli a chance to grow and produce tetanus. This was very interesting in its relation to tetanus coming on after operative procedures where there was some involvement of the intestinal tract. If they could keep the intestinal tract free from suppurative lesions they probably could use catgut sutures that did have on them the tetanus bacilli without results. In other words they could use as a suture material catgut which had only a few tetanus spores without danger of tetanus developing if they kept free from suppuration. Whereas in those cases where there had been much trauma, or where there was an accompanying staphylococcus infection, the tetanus bacilli would be given a chance to produce its toxins and tetanus would develop.

Dr. Norris recalled the case Dr. Studdiford had spoken of, and he had been very much surprised at not being able to infect guinea pigs with tetanus.

Dr. HENRY C. COE said that ten years ago he read before the American Gynecological Society a paper on tetanus following abdominal section, reporting two cases occurring in his service at the Memorial Hospital. One other case seen since had been alluded to by the President. The origin of these cases was unknown. The first patient (hysterectomy for fibroid) was a

private one and died of tetanus on the thirty-fifth day following a simple operation, in the second, death occurred on the eleventh day. In neither case was an autopsy permitted, but blood-cultures were negative. In neither instance was the appendix removed.

In the second case, Dr. Jarman did a hysterectomy and Dr. Coe assisted him. Dr. Coe's case followed after Dr. Jarman's. Dr. Jarman's patient recovered without any symptoms whatever, while Dr. Coe's patient developed tetanus on the tenth day. So far as the reporter knew, no patient has ever recovered who developed tetanus after laparotomy. It was a recognized fact today that the true treatment of traumatic tetanus is prophylactic, but how can this be applied after laparotomy, when there is no reason to suspect such an attack?

Dr. Robert T. Frank recalled an article by Dr. Peterson which had appeared about two years ago in the *Journal of Surgery, Gynecology and Obstetrics* on "Postoperative Tetanus." In this article the statement was made that the authors had been able to isolate the tetanus bacillus from the bowel in these patients. The tetanus bacillus was not rare in animals, possibly it occurred more frequently in human beings than we are aware. By some accident the tetanus bacillus, which had been a resident in the patient, might then be introduced into the wound and cause the infection.

DR. WILLIAM P. HEALY recalled a case at Roosevelt Hospital. This patient was operated on by Dr. Tuttle and was making a normal convalescence following the removal of multiple fibromyomata of the uterus; the appendix was also removed. On the seventh or eighth day after the operation tetanus developed. A year and a half or two years previous she had a friend who developed tetanus following some operation and when her symptoms of tetanus developed it was assumed that she was hysterical. But it was soon recognized to be a case of true tetanus. This patient died in forty-eight hours. The patient came from Mexico and there the tetanus bacillus is frequently met with, especially in the intestinal tract of human beings and, as a result, the surgeons there often hesitated before doing gastrointestinal surgery.

It was assumed that the appendix stump, which was inverted, was the probable portal of entry for the germs.

DR. GEORGE W. JARMIN said that he had seen another case, one that had an abscess of the breast which was excised by Dr. Gibson. It had been about fifteen years since he had met with a case of tetanus at Bellevue Hospital. These operations for abscess of the breast seemed to be favorable ones for the development of tetanus. This was a simple case; an operation which was not at all difficult to perform. It was a fact that tetanus developed only in these suppurative cases; it might be that suppuration provoked the growth of the tetanus bacilli. The cases that he had seen develop were the simple cases and

those in which temperature developed after the operation and the cases in which there were no bad symptoms whatever. There was something in the question of prophylaxis that should not be lost sight of. At present there seemed to be a fatal prognosis in these postoperative tetanic cases.

Dr. JOSEPH BRETTAUER said that inverting the appendicular stump would not militate against tetanus arising from that origin.

Dr. Brettauer remembered distinctly the case referred to by Dr. Coe; a vaginal hysterectomy was performed and catgut was used. Personally he used very little catgut, and never used it as ligature material. In a hospital where thousands of all kinds of operations are performed this was the only case of post-operative tetanus.

The paper of the evening entitled

INTERPRETATION OF UTERINE CURETTINGS*

was read by Dr. ROBERT T. FRANK.

DISCUSSION.

Dr. WM. E. STUDDIFORD asked Dr. Frank if the time relation between the curettings and the menstrual period were of value to the pathologist in making his diagnosis.

Dr. CLARENCE R. HYDE was particularly interested in Dr. Frank's paper because it explained a point in the histology of the endometrium which had been bothering him for some time. At the last meeting of the Woman's Hospital Society, he was asked if the endometrium was a mucous membrane; to which he replied that it was. He was then told there were no goblet cells in the endometrium and that goblet cells were necessary for the production of mucus; further, that it had never been established that the endometrium secreted mucus. In order to settle the question, definitely for himself, he asked two prominent Brooklyn pathologists their opinion. They said there were no goblet cells in the endometrium and that goblet cells were *not* necessary for the production of mucus; but they could not state positively whether the endometrium secreted mucus or not. Dr. Hyde, in consulting many authorities, found none which said anything about mucus being secreted from the endometrium. All agreed that the endometrium had a secretion but that it was serous in character. J. Clarence Webster, in his "Human Placentation," in which he goes deeply into the histology of the endometrium, merely says that the secretion is serous in character. All authorities, however, agree that the secretion from the cervix, is mucous. Dr. Hyde said that he was advised that a mucous membrane did not have to secrete mucus to be called a mucous membrane, nor were goblet cells necessary.

Dr. Hyde wished to ask Dr. Frank if he had any authority for

*For original article, see page 207.

stating that mucus was secreted by the utricular glands, or whether he had ever known of any chemical analysis having been made to determine the presence of mucin in the endometrial secretion. He further wished to know Dr. Frank's opinion as to whether a mucous membrane had to secrete mucus. Are there any so-called mucous membranes which do not secrete mucus?

DR. ROBERT H. WYLIE did not know whether it came within the scope of the paper but he would like to know if a consideration of the scrapings would show changes in the endometrium, that was if there was any anatomical proof that diseased conditions of the ovaries could cause an endometritis. Was there any truth in such a statement? Again was there any method in giving medicines internally that would have an effect upon the ovaries?

DR. FRANKLIN A. DORMAN said that the question up before them, was, should they curette less in these cases? Could they put aside curettage? In the hemorrhagic cases, with irregular bleedings, they were often disappointed with the results of curettage, for the bleeding promptly recurred. He said he had an interesting experience last spring with such a case. The patient was a woman, forty years of age; irregular flowing began and within two or three weeks she was very much exsanguinated. An examination revealed a uterus that appeared to be about the size of a two months' pregnancy. She lost so much blood that she was compelled to remain in bed. A curettage was advised. She was sent to the hospital, was curetted, and there was found a greatly thickened endometrium. Further examination under ether revealed a thickened, large cystic ovary which was removed. About six weeks later she again began to bleed; although, three weeks after the operation the uterus was of normal size. Then the uterus was found to be enlarged to about the size of a two months' pregnancy. Again she was curetted and the material brought out was examined by a pathologist who reported that it was an adenoma. Then it was believed that her only cure was in having the uterus removed. After consultation, this was decided upon. Another pathologist who examined the specimen from the uterus reported that it was largely an hypertrophied endometrium. He asked Dr. Frank if a non-malignant adenoma was a recognized condition. He believed that one must still adhere to curettage, yet bearing in mind the possibility of ovarian source of the trouble.

DR. HENRY C. COE asked Dr. Frank if one could gain any assistance from an examination of the scrapings or curettings in cases of ectopic gestation. Would the presence of epithelial cells, with certain clinical symptoms, and with the presence of a mass help in making a diagnosis of this condition? He asked too how he could explain certain cases of persistent metrorrhagia after the ovaries had been removed. Dr. Coe had seen two or three such cases.

DR. ROBERT T. FRANK closed the discussion. In reply to

Dr. Studdiford's question, if the time relation between the curettings and the menstrual period was of value to the pathologist in making his diagnosis, he said that it certainly was of some assistance.

With regard to Dr. Hyde's remarks about goblet cells, and what he considered a definition of a mucous membrane, he could not answer in full; however, the secretion from the uterine mucous membrane was small in amount. During the premenstrual stage glycogen was present in the secretions, and there was also in all probability an increase in the ferment content; this occurred at certain times. He was not aware of any chemical researches bearing upon the question and certainly none which definitely determined the exact nature of the product.

In answer to Dr. Wylie's question whether there was any definite anatomical proof, of diseased conditions of the ovaries which caused endometrial changes, he did not believe there was any. However, there were certain facts which made it almost certain that functionally disturbed ovaries were the cause, of many of the cases of uterine hemorrhage, discharge, etc. Just exactly what part they played, and what mechanism was involved, was not definitely known. They knew for instance that fibroids, even those that were not submucous, were accompanied by hypertrophic changes in the endometrium; certain investigations seemed to show that there was present a stimulus which caused the growth of the fibroids and likewise an hypertrophy of the mucous membrane of the uterus. The question was too big to discuss more fully in this connection.

Dr. Dorman had asked what was the final stand to be taken if they were to accept some of these researches. One result would certainly be to limit the application of the curette. Functional conditions could cause an increase in the amount of secretion, but whether chronic inflammation could cause a similar increase he did not know. Hemorrhage was present in many cases. Curetting in a great many of these cases was very unsatisfactory and it was true that there were other measures which could be employed that would take the place of curettage. Curettage could not be entirely discarded for it would always be needed to diagnose the presence of tumors; however, Dr. Frank believed that the use of the curette without more definite indications than for instance the fact that after an early abortion the decidua remained in the uterus was out of place. Under ordinary conditions the uterus could care for itself, and absorb the material present which was nothing more than a mucosa which had undergone a slightly exaggerated monthly change and soon returned to normal.

Recent studies had shown that the endometrium regenerated in an extremely rapid way. Uteri when curetted might menstruate within three weeks or they might bleed within even a shorter time corresponding exactly to the normal date of the expected menses.

So far as adenoma of the uterus was concerned Dr. Frank did not think that the pathologist was willing to recognize such a thing as a simple non-malignant adenoma of the uterus. It was possible, however, that in the early stages of the disease it might prove impossible to recognize the so-called adenoma malignum.

In answer to Dr. Coë's question regarding the uterine casts or curettings in cases of ectopic gestation, considerable value could be placed on them. At the same time, it might happen that there was no ectopsis present, and yet from the examination of the scrapings the diagnosis of ectopic be made. Dr. Frank expected to present a case of this nature at the next meeting and therefore would not enter into detailed discussion of this question now.

So far as post castration hemorrhage was concerned, this was a very interesting question and much insight might be gained by using them to distinguish between the hemorrhage occurring with ovarian troubles and hemorrhage that occurred independent of the ovaries. Unfortunately it is impossible to exclude the possible presence of a supernumerary ovary or some small remnant of an ovary supposedly removed in toto, and therefore these cases are robbed of much of their significance.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of December 7, 1911.

The President, WILLIAM M. POLK, M. D., in the Chair.

IMPORTANCE OF FAULTS OF DEVELOPMENT IN THE PRACTICE OF GYNECOLOGY.

DR. EDWARD REYNOLDS of Boston compared the surgery of ten years ago with the surgery of to-day. Twenty years ago surgical operations were undertaken only for the purpose of saving the lives of those who were otherwise doomed to death, or to alleviate unbearable pain. To-day most of our surgery is undertaken to improve the health of the individual, and the surgery for the prevention of disease is already in existence. Most of this modern surgery is done upon more or less defective individuals, *i.e.*, most of the lesions for which operations are done are the result of some local imperfection. There is no more general law than that developmental imperfections are seldom single, that the individual who has one such defect usually has others. The surgeon should then look at such patients as a whole and not concentrate his attention solely upon one individual local lesion.

He prefaced his remarks upon the abdominal ptoses by excluding from consideration for the minute those cases of ptoses which result from rapid emaciation and loss of the supporting fat, as well as those in which the ptosis is merely a part of a general muscular relaxation. These ptoses are never operative. The surgical ptoses are, on the contrary, always a ptoses of an individual organ, and such ptosis usually results from some developmental defect in the supports of that organ, but, as has been said, such a developmental defect is usually associated with other maldevelopments.

To refer briefly to the individual ptoses: He said that the condition commonly referred to as Lane's kink is in reality usually developmental, *i.e.*, an abnormally movable colon (defective supports) in combination with an abnormally fixed terminal loop of ileum.

The ptosis of the transverse colon which most commonly causes symptoms is that known as the U-shaped colon, in which the stomach and the middle of the colon proptose together while the angles of the colon are properly supported. This condition may of course be sometimes due to the weight of great distention in the upright position, but even then it usually occurs only in individuals with defective general development in which the converse of the law already stated suggests local ill development.

There is apt to be the same family resemblance in appendices that there is in noses. Every one has known families in which many or most of the members have had appendectomies. Such people become liable to distention of the appendix, in the majority of instances, from an unfavorable shape of the appendix—too great length (failure of involution), flexure of the appendix (maldevelopment of the mesoappendix), etc.

Constipation is often dependent upon defective development of the intestine. The sigmoid is frequently bent into a sharp angle by its normal adherence to both sides of a left broad ligament which extends too widely and too far posteriorly across the left half of the pelvic brim (proptosis of the sigmoid). This is due to a failure in retrogression from a condition normal in fetal life. Abnormal development of the so-called pre-anal pouch is an extremely common cause of constipation in women. It is a malformation which shows a distinct tendency to appear throughout certain families.

Every one knows that the length of the uteroovarian ligaments varies greatly. Prolapsed ovaries occur, and can occur primarily, only in individuals with abnormally long ligaments, an atavism to a condition common in our remote ancestors. He had recently seen severe ovarian pain due to a similar atavism in which one ovary was contained in a distinct pocket on the posterior side of its broad ligament, a condition common in the rodents and feræ.

An important maldevelopment is that known as anteflexion of the cervix. This condition is normal in the child up to the age of puberty. Its persistence in the adult woman is abnormal. It

has been commonly looked on as an alteration in the intrinsic shape of the uterus. Recent observations go to show that it is less an alteration of shape than a flexion due in large part to a coincident under-development of the anterior vaginal wall and the structures commonly summarized under the name of the uterovesical ligaments. The result of any contraction in the muscular fibers which exist in all the so-called uterine ligaments is the production of an obstruction in the lumen of the cervix such as that which is made by bending a thick rubber tube. There is a curiously frequent coexistence of the condition known to orthopedic surgeons as the flat-backed—round-shouldered—position with these cases of ante flexion of the cervix. The relation of ante flexion of the cervix to dysmenorrhea is due to the fact that the menstrual congestion increases this flexion. Its relation to sterility is due to interference with the upward passage of the spermatozoa by retained uterine and cervical secretions.

All these abnormalities as well as the long list of others which could be cited occur usually in otherwise ill-developed individuals, and the point of main value in the discussion of this whole subject is the lesson, that the gynecologist should bear in mind that faulty development is seldom single, and that he should look the woman over as a whole, and treat her as a whole. He said that it should not be forgotten that the neurasthenic is always an under-developed person and that her under-development must be looked at as a whole. If one looks at the abdominal or abdominopelvic organs only, mistakes will certainly follow in the treatment.

DISCUSSION.

DR. EDWIN B. CRAGIN said the one thing that impressed him in hearing Dr. Clark's paper was that in the practical dealing with the subject under discussion they should be sure they were in truth dealing with a surgical case before they subjected the patient to any operation. What they should carry away in their minds was the fact that cases should be excluded which were due to lack of fat in the body tissues; these certainly were not the operative cases. Many of the cases they met with were due to a loss of body fat; such a loss resulting in a ptosis of many of the abdominal viscera. Furthermore, any case that could be relieved by medical measures was not a surgical case, but any case that could not be relieved by medical measures and presented obstructive symptoms then became a case for the surgeon.

With regard to ante flexion of the uterus being the result of maldevelopment, this had been looked upon by many gynecologists as merely a displacement; but for many years Dr. Cragin had taught that this was a fault in development and the way to treat such patients was to treat the cause of the maldevelopment or nondevelopment of the uterus and also the result. He said he could not agree with the statement made by Dr. Reynolds that many of these cases of ante flexion of the cervix would go back

into normal shape under the use of an anesthetic. Some would but in his experience not many.

In the treatment of these patients mere dilatation followed by the introduction of a sterilized stem would in many instances straighten out the uterus, improve the drainage from it, improve the circulation of it, relieve the dysmenorrhea and, at the same time, favor the development of pregnancy. The pregnancy would complete the development of the uterus.

Dr. Cragin said that he could not very well leave the subject without speaking of the effect of malformations of the pelvic organs upon obstetrics, the sister of gynecology, and the importance of a correct diagnosis in the different forms of duplication of the uterus and vagina. In one form of uterine duplication, the uterus bicornis, the obstetrician occasionally found the child in one horn and the placenta in the other. He had seen two such cases at the Sloan Hospital for Women within the last few years. Again, one occasionally found the unimpregnated half of a double uterus obstructing delivery from the pregnant half, or even causing a rupture between the two halves as seen by him not long ago. Furthermore, he had met with a case of double vagina, in which, during a breech delivery, one foot and a loop of cord had come down in one vagina and the other foot in the other vagina. It was only by rapid division of the septum in this case that a living child was obtained. These were some of the obstetrical complications resulting from faults in development of the pelvic organs.

DR. HERMAN J. BOLDT said that there were a large number of instances of antelexion of the cervix—or as he defined them, retroversion of the cervix—in which there were no symptoms at all. There was another class, however, in which the individual required treatment and in the way outlined, or otherwise. So far as the results of the treatment was concerned, it was in many instances a matter of personal equation. Many of these cases of malformation should be treated in a surgical way.

It was Br. Boldt's privilege to see Dr. Clark operate on one of the class of cases described by him as requiring operation and he was impressed with the fact that he was careful in the selection before resorting to surgical intervention.

DR. ROBERT L. DICKINSON had strong commendation for the breadth of view of the two surgeons. He, too, would warn against surgery until a full history and complete study of the individual had been made. The beginning of the examination should involve stripping the patient at least to the underclothes. Striking anomalies were often found in the cases of enteroptosis, or flexions. As examples, a number of pictures were thrown upon the screen, showing grave defects of development, some general, as in the infantile type, some of the trunk only, as in arrest of development from clothing and in-door life. Beside the congenital aberrations, acquired defects of attitude were depicted and sample methods of office observation and record. Tempo-

rary support pending general upbuilding and correction was dwelt upon. As adjunct to these surgery had a limited but important field.

DR. ROBERT T. MORRIS was glad to note that in dealing with defective organs we are taking more cognizance of the existence of decadent people. Most of us show some of the stigmata of decadence, but in cases where we have such a distinct feature as the infantile type of uterus, we must assume that other stigmata of decadence are also present. We usually have a number of developmental defects associated with any one that is most in evidence.

Dr. Morris said that he was sceptical in regard to what had been said about autointoxication from a flexed uterus, because he had made cultures too often from the interior of such uteri, and had so frequently found the contents sterile.

Concerning the treatment of patients with relaxed peritoneal supports, aside from the patients in which this condition was due to great loss of fat, we are dealing usually with neurasthenic patients. Relaxation of peritoneal supports is only an incident in a long history. Secondary symptoms, including toxemia, follow in many of these cases, and require treatment, but the most important thing is to take into account the fundamental fact of the presence of stigmata of decadence.

He was one of the first to take up surgery of ptosis of viscera, and he shortened various ligaments. These patients are apt to make a prompt response, apparently showing benefit, and yet in a year they are back again with a new group of symptoms.

At the present time he would not employ surgery until all resources of competent internists had been employed, including abdominal supporters, massage, posture, hydrotherapy perhaps. He would in fact make every endeavor to avoid surgery as a rule. It was a different matter when we had ptosis of a single viscus, like the kidney, in which secondary symptoms could be relieved with great satisfaction, if we made proper selection of cases.

DR. A. JACOBI said there was a time he examined a great many uteri; many were sterile and anteфлекed; many of them were so, as the result of insufficient development. Many of these infantile uteri were treated by stimulation through the frequent introduction of a sound, with or without the use of electricity. That would gradually improve the growth of this type of uteri and not infrequently pregnancy would result. These were the cases in which there was no obvious inflammation or trauma present.

With regard to the colon we should be taught or warned that the sigmoid flexure was in every newly born, very long, the ascending portion of the colon short; that the transverse colon began lower than normal.

The sigmoid was so long that it often reached to the median line and beyond. This was the reason why a surgeon in Paris insisted upon operating for artificial anus in the newly born, upon

the right side and not from the left. Huguier performed this operation repeatedly. The patient had what D. Jacobi had called congenital constipation. Forty-five years ago he operated upon a new-born baby because of abstriction. Injections were first used without any effect. Three, four and five days passed and no movement of the bowel resulted. He then decided to operate and form an artificial anus; the child died of peritonitis. At autopsy no anatomic obstruction was found and only masses of hardened meconium, and large amounts of dried mucus. Soon after Dr. Jacobi saw another case in which there were these hardened clumps of meconium but surgery was not resorted to and the baby was saved by persistent irrigation. The excessive length of the descending colon causes the occurrence of two of even more flexures. The resulting constipation must be treated by daily enemata until the children are six or seven years old. Then the "congenital constipation" by the development or more normal proportions of the several parts of the lower gut.

DR. EDWARD REYNOLDS of Boston in closing the discussion said that the patient who was a subject of ptosis was almost invariably an ill developed person. A general under-development must be of extreme degree to be visible under the disguise of modern clothing. It ought to be a general rule that before any surgeon operated for ptosis he should look over the patient's whole frame in as nearly a stripped condition as possible. He ventured the opinion that if the whole body were thus looked over, the surgeons would realize in nine cases out of ten that the ptosis was only a part of the trouble, and would be more apt to send the patient to an orthopedic surgeon for gymnastic and similar treatment than to permit himself to operate.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Symptoms, Therapeutics, and Etiology of Eclampsia, from Statistics of 400 Cases.—Lichtenstein (*Arch. f. Gyn.*, Band xcv, Heft 1, 1911) gives the conclusions arrived at from a study of 400 cases of eclampsia observed at the Frauenklinik at Leipzig. The mortality of eclampsia in the puerperal state is unusually high. The mortality after premature delivery is no better than after rapid delivery. It is very little less than the collective mortality. A great difference in eclampsia cases depends on the amount of blood lost; the puerperal eclampsias are coupled with little loss of blood since in 90 per cent. of these cases there has been a spontaneous delivery. The usual amount of blood lost in eclampsia is 500 c.c. or 100 to 150 c.c. more than ordinarily. Operative deliveries increase this loss of blood over spontaneous deliveries 40 per cent. We see that the results of premature or

rapid delivery depend not on the delivery of the child, but on the amount of blood lost. This loss of blood acts like a venesection. As a prophylactic treatment of eclampsia withdrawal of blood is useful because the poison is drawn from the mother's veins. After labor venesection is indicated because there has been little loss of blood in these cases. Curetment after delivery in eclampsia acts like the venesection. It is indicated to remove blood before labor in eclampsia, as a prophylactic measure. Statistics speak against the placental theory of eclampsia. In 30 per cent. of cases which came to autopsy there was found dilatation of the ureters and pelvis of the kidneys.

Ammonia Coefficient as Indication for Emptying the Uterus in Toxemia of Pregnancy.—J. B. Drummond (*Maine Med. Jour.*, 1911, ii, 550) says that an increased ammonia coefficient indicates a serious change in nitrogenous metabolism. It is an index of the gravity of the toxemia of pregnancy; it is of diagnostic value in determining the toxic or neurotic origin of the disturbance of pregnancy, and is of diagnostic value in acute yellow atrophy of the liver. An examination for it is of great importance in all of these cases which give rise to anxiety on the part of the physician, not only on account of its diagnostic value, but also on account of the positive indication for treatment which it affords.

Surgical Treatment of Uteroplacental Hemorrhages with Separation of the Normally Inserted Placenta.—A. Couvelaire (*Ann. de gyn. et d'obstét.*, Oct., 1911) reports a case of separation of the placenta with retroplacental hemorrhage, in which Porro's operation was done to save the patient. In this case there were infiltration of the uterine walls with blood and a hemorrhage into its substance, a true uteroplacental apoplexy. The patient attacked by such a condition is generally the subject of toxemia which is manifested by albuminuria, retention of chlorides and nitrogen, and arterial hypertension; that is, hepatotoxemia. The uterus is very hard, there are hemorrhagic shock, a dead fetus, and slight uterine flowing, all indicating concealed hemorrhage. It is impossible to obtain rapid dilatation on account of the hardness of the uterus, and some rapid operation must be done for relief of the hemorrhage, if we would save the mother. The author thinks the abdominal operation the best, and the Porro operation should be done.

Cranial Malformations in their Relation with Obstetrics.—Ferdinand Nasay and Andre Louyot (*Rev. mens. de gyn. d'obstét. et de pæd.*, Oct., 1911) have studied three cases of malformation of the cranium in the fetus; one case of hydrocephalus, one of anencephalus, and one of nondevelopment of a part of the cranium. Congenital hydrocephalus, if sufficiently developed to be diagnosed during labor, will cause death of the fetus or idiocy; therefore we may disregard the life of the fetus and deliver rapidly after perforating the cranium and allowing the water to flow out. If the forceps is introduced the separation of the branches gives prompt warning of the increased size of the

head. In cases of anencephalus there is always hydramnios. The fetus is delivered prematurely, and labor is very easy, the child dying at birth or soon afterward. The cause of this deformity is the formation of constricting bands of amniotic tissue which compress the head.

The Wassermann Reaction in Cases of Fetal Monstrosity.—Montanelli (*Rend. Soc. Toscana di ostet. e gin.*, Nov. 20, 1911) has tested with the Wassermann reaction the parents of several cases of monstrosity of the fetus observed recently by him, with a view to ascertaining the relation of syphilis to the production of these monsters. In the production of such monsters the condition of the parents is of the first importance. It has been shown that physical and mechanical injuries influence in animals the production of amniotic adhesions and malformations resulting from them. The general pathological conditions of the parents as well as the local uterine conditions of the mother influence these deformities. Fournier believes that syphilis has much to do with their production. Intoxications and infections, alcoholism, etc., also influence their production. It is not necessary to invoke a bacterial transmission to the fetus; the unfavorable condition of the mother's system is sufficient to affect the fetus. Syphilis need not be directly transmitted; hereditary syphilis is capable of causing changes in the fetal tissues which affect its development. The Wassermann tests were applied to the parents in nine cases observed by the author, which he tabulates; to the fetal serum when possible; and to the amniotic fluid in one case. He found positive results in but one case of those tested. In this mother there was a hemiplegia of arteriosclerotic origin. The author thinks that the reaction of Wassermann is an assistance in the diagnosis of syphilis in these cases. When absent the test does not exclude syphilis of the parents, but when present it does make a positive diagnosis possible.

Vaginal Cesarean Section; its Technic, Results, and Indications.—Cyrille Jeannin (*Progrès méd.*, Oct. 21, 1911) says that the vaginal Cesarean section is applicable to all cases of induration and nondilatation of the cervix uteri in pregnancy. The classical abdominal Cesarean section is applicable to conditions in which there is a narrowing of the pelvis, while the vaginal is never applicable in such cases. The Dührssen operation, as it is called, should have a place in surgical obstetrical practice. It is easy of execution and when done carefully and conforming to certain necessary rules has few complications and causes few bad symptoms. It is indicated whenever immediate evacuation of the uterus is necessary and when the ordinary Cesarean section cannot be done on account of the condition of the woman. Again it is indicated by a lack of dilatability of the cervical tissues. It is contraindicated by contraction of the pelvis, pelvic tumor, atresia of the vagina, very large fetus, abnormal implantation of the placenta, and previous infection. It is useful in the interest of the mother in eclampsia, separation of the normally implanted

placenta, cardiac accidents, rigid cervix, and amniotic infection; in the interests of the child in prolapse of the cord, agony of the mother, and death of the mother. It consists of incision low down of the cervix in the median line, anteriorly or posteriorly, a location in which hemorrhage is slight, below and outside the peritoneal cavity. The author thinks we cannot have too much room, so as to be able to see what we are doing. The uterus is drawn down, the anterior culdesac opened, and the anterior wall of the cervix incised. The posterior lip is incised and the peritoneum separated. The child is extracted by forceps or version; the placenta delivered, and the uterus tamponed with antiseptic gauze. Sutures are placed to close uterus and vagina, and the perineum is repaired. The prognosis is good. The complications are hemorrhage, tearing of the uterus, lesions of the peritoneum and bladder, and postoperative infection.

Rupture of the Uterine Cicatrix after Classical Cesarean Section.—Vogt (*Arch. f. Gyn.*, Band xcv, Heft 1, 1911) says that since the general use of antiseptic measures in operations the cases of rupture of the uterine cicatrix after the classical Cesarean section are very few. Säger believes this to be due to the exact apposition of the uterine wound by suture. After 500 cases he had had no case of rupture. Essen-Müller thinks that rupture occurs in cases in which the healing has been interrupted by infection. The location of the placenta has much influence upon the perfect healing of the uterine wound; as have the position of the uterine incision, the method of suture, and material used for the suture. Gonorrheal infection may cause bad healing of the wound. A case that is clinically and bacteriologically cured may in the puerperal state again show gonococci with an ascending infection. Out of 100 cases Kustner had no ruptures; out of 232 Leopold had none. Operative deliveries prove the hardest test of the integrity of the cicatrix. The prognosis for the child is bad; the loss of blood may kill the child if the rupture is large. In most cases it is not large, but the placenta may be partially separated. The author concludes that rupture after Cesarean section is a rare complication of labor, and one of which the prognosis is not bad, either for mother or child. Prophylaxis lies in a reactionless healing after exact apposition of the uterus. A patient who has had one section and has not been sterilized should be supervised by a physician, preferably in the hospital, during the last months of pregnancy. In the treatment of rupture immediate surgical interference is needed.

Transmission of Antibodies from Mother to Child.—W. Wegelius (*Finska Läkaresällsk. Handl.*, September, 1911) after experiments on goats and dogs with vibriolysin, tetanus toxin, and coliagglutinin before conception and during pregnancy with active and passive immunization, state that when a pregnant animal's blood contains antibodies these are found also in the blood of the offspring. This takes place with both active immunization of the mother before or during pregnancy or passive immunization.

The immunity of the young has a passive character no matter what method is used in immunizing the mother. Active immunity is not produced in the young. The young have generally a higher amount of antibodies in the blood than the mothers. The placenta must exercise a selective action over the materials found in the serum of the mother. Passage of antibodies to the child by the milk is not seen. The explanation of the immunity of infants to scarlet fever and measles for the first year of life may be that there is a sufficient amount of antibodies of maternal origin in the blood of the infant to immunize it for a time against these diseases.

Observations on the Author's Credé Treatment of Infants.—Hugo Hellendall (*Zeit. f. Gyn.*, Oct. 21, 1911) has made use of silver nitrate solution in ampullæ with a special pipette and found it very useful. He believes that the so-called silver catarrh seen in children who have been treated with 1 to 2 per cent. silver nitrate solution is not due to the silver but to a certain amount of acid contained in the solution. The results obtained by silver and sophol are about the same, there being .06 to .07 per cent. of catarrhs following their use. Silver is undoubtedly the best preventive of infections. In the cases of 1,000 children treated by the author 9.5 per cent. had catarrhs. This he found to be due to the presence of free sulphuric acid in the silver ampullæ. After this he had the makers take pains to supply ampullæ in which the solution remained constant and uncontaminated for a long time. The glass of the ampullæ was carefully cleansed, and then heated. The results were then much improved. Out of 505 cases treated there were catarrhs in 0.19 per cent. only.

Popular Misconceptions Regarding Ophthalmia Neonatorum.—Speaking of the neglect of physicians to employ in private practice Credé's prophylactic instillation of silver nitrate. E. M. Alger (*N. Y. State Jour. Med.*, 1911, xi, 593) says that physicians often feel that in the cases of most of their patients and friends prophylaxis against a venereal disease would not only be unnecessary but almost insulting, and it would certainly be so regarded by most of these patients if they were consulted in the matter. If we teach the absolute truth, and convince both physician and mother, that ophthalmia is not necessarily a disgraceful occurrence, but that in from one-third to one-half the cases result from such common organisms as the pneumococcus, the colon bacillus, or any of the various pus germs so often found in vaginal secretions, the physician will at once see the advisability of prophylaxis in every case, while parents will no longer feel insulted at the suggestion of such a precaution. Regarding the treatment of ophthalmia neonatorum, he says that the outer layer of the cornea is extremely resistant to infection and, so long as this remains intact, the eye is safe enough, but even the slightest abrasion of this membrane permits an often fatal infection of the less resistant tissues of the cornea proper. Every

precaution should therefore be taken to preserve the integrity of the corneal epithelium, while as a matter of fact the usual program of meddlesome interference would sooner or later abrade the cornea of a perfectly healthy eye. Strong solutions of all sorts should be avoided on this very account, and likewise compresses and poultices which increase the pressure of the lids on the cornea. A clumsy or a heavy handed nurse or physician in the effort to evert the lids will very often damage the cornea while efforts to pry open the eyes and irrigate them at frequent intervals is almost sure to do harm. The prognosis in any given case depends more on the vitality and nutrition of the child than on any other one factor. The bacteriological diagnosis is of secondary importance, for the treatment is the same no matter what the germ. The indications are clearly for nutrition, cleanliness, and drainage, with the minimum amount of interference necessary to secure them. Once a day the physician should drop one drop of 1 per cent. silver nitrate solution into the eye. The mother or nurse should be taught how to hold the child's head firmly between her knees and to open the eyes by gentle traction from the superior and inferior margins of the orbit, without making any pressure on the eye. It is not necessary for her to see the cornea. It is sufficient if the lids open wide enough for pus to flow out and solutions to flow in. She is directed to sponge the closed eyes very gently with pledgets of cotton and boric acid as fast as notable secretion accumulates and the lids are prevented from sticking by applications of oil or vaseline. Every three hours or so, seldom oftener, a drop of 20 per cent. argyrol solution is instilled. By a little gentle lid manipulation and without any pressure on the eye it can be made to penetrate in all directions under the lids.

Should Placental Remains be removed after Delivery at Term?

—Karl Hörmann (*Monatsschr. f. Geb. u. Gyn.*, Oct., 1911) considers the question whether the presence of placental remains after normal delivery will tend to cause fever and puerperal infection. The author admits that there are some cases of puerperal infection which seem to be connected with the nidus of bacterial infection which is presented by the presence in the cavity of the uterus of membranes and portions of the placenta. At the same time these remains are often removed spontaneously by the natural forces of the uterus and the loosening which occurs. The greatest danger to which the patient is exposed is not sepsis but postpartum hemorrhage, occurring at the time of this separation. The author has observed thirty-six cases of retained placenta in the last ten years at the Frauenklinik of Munich. Before evacuation of the uterus twenty of these women had been absolutely afebrile. The other sixteen had a slight rise of temperature before delivery, but without serious symptoms. The cause of the fever was slight intoxication or resorption of fetal products. Two women were infected before delivery. In none of these cases could it be said that through deficient evacu-

ation infection followed, nor did any death occur. Hemorrhage was to be feared, and this indicates an immediate removal of the placental remains. Every such patient is in danger of large hemorrhages unless this is done. In the cases treated, extraction was done twenty-three times with the finger; nine times with instruments; through tamponade of the uterus, once; by uterine injections, three times.

Protoplasmic Enzymes of the Placenta in Normal and Pathological Conditions.—Paolo Giamini (*Folia gyn.*, vol. vi, fasc. 1, 1911) has made examinations of freshly delivered placentas in normal and pathological cases, with reference to the presence of proteoplasmic ferments. In all, fifty-eight placenta were examined, taken from patients at various periods of pregnancy, from the first month to the eight. The tests were made with the placenta itself, with aqueous extract of the juices, and with a glycerine extract of the enzymes, made immediately after expulsion of the placenta. His conclusions are these: There is no evidence of an enzyme digesting the higher proteids; an enzyme was demonstrated in the human placenta that is markedly proteolytic in an alkaline medium. The quantity of enzyme extracted is comparable to a 2 or more per cent. trypsin. This enzyme is independent of the blood which remains in the placenta. It is not specific to the chorionic villi but is also found in the most various tissues of the organism. In the colostrum of fetuses which have died in the uterus the peptolytic enzymes are much diminished. This enzyme is present both in the fetal and the maternal portion of the placenta. It loses its activity at 37 to 55° C. It is not influenced by toluol or phenic acid. It may be preserved for a long time. It is demonstrable in small amount in the early months of pregnancy. It is especially abundant in the placenta of women who have albuminuria and eclampsia, and in those who have macerated fetuses. There is always evident in the blood serum an antitryptic power and a power of inhibition of the peptolytic placental enzyme.

Pathogenesis and Treatment of Puerperal Eclampsia.—Bar (*Ann. de gyn. et d'obst.*, Nov., 1911) says that the condition of the kidneys in eclampsia cannot be the sole cause of the convulsions, since convulsions occur in women whose kidneys are not seriously diseased. The renal trouble may not precede the attacks but may appear at the same time. In the liver there is a double lesion; cellular and hemorrhagic, the cellular lesion being the principal one. The hepatic lesion may appear only at the time of the seizures. Neither of these two classes of lesions seems to be the primary cause of the eclampsia; still they are the cause of serious symptoms. Neither is the hypertension to be considered the primary cause of eclampsia, although it may be the immediate cause of the attacks. The serum of eclampsia has been shown to have marked toxic properties. The blood is modified by the presence of various poisons; lipoids, proteid materials, ferments, enzymes, etc. The chemical con-

stitution of the primary poisons is unknown, that of the secondary ones we do know.

Blood Pressure Index of Eclampsia.—H. C. Baily (*Surg., Gyn., Obst.*, 1911, xiii, 505) states that the average blood pressure in the last weeks of pregnancy is 118 mm. of Hg. Fluctuations amounting to 30 mm. of Hg. above this need cause no alarm. Blood pressure over 150 should be thoroughly investigated at once. Blood pressure in eclampsia with convulsions, though usually in the neighborhood of 200 mm. of Hg., may be as low as 155 mm. Convulsions do not occur when the blood pressure is lowered by poor resistance as in the so-called fulminant cases or when lowered by veratrum viride or other drugs producing collapse. Treatment should be directed not toward reducing the blood pressure but to the treatment of the toxemia for the rise of blood pressure may denote only the resistance of the system toward the toxins. Triweekly blood pressure examinations combined with the regular urine examinations for albumin and casts offer the best safeguard against the unexpected presence of this disease.

Peritoneal Inundation in Tubal Abortion.—Vautrin (*La Gyn.*, Nov., 1911) calls attention to the fact that peritoneal inundation in tubal pregnancy occurs not only after rupture of the tube, but also with considerable frequency, in tubal abortions. But this condition is not easy of diagnosis and a rupture of the delicate thinned tube is easily caused by the manipulations of examination, so that the specimen may show a rupture that was not primary. If the pregnancy is in the uterine end or the fimbriated end of the tube rupture is unlikely. It is when the ovum is contained in the middle portion of the tube that rupture occurs. Abdominal abortion is likely to occur in ampullar pregnancy. If the blood contained in the abdomen is bright it is from a recent rupture; if it is from a tubal abortion it will be venous and darker. Abortion occurs before the end of the third month of pregnancy. The abdominal end of the tube remains open the first few weeks of pregnancy; later it becomes agglutinated by inflammatory products. The imperfect union of the ovum with the wall of the tube, its poor vascularization, and the poor nutrition of the ovum prepare for the abortion. At the congestive period of the uterus a hemorrhage occurs between the ovum and the coverings. Morbid alterations of the ovary which affect the proper formation of the corpora lutea may be responsible for poor vascularization, the lack of nutrition. A diseased ovary, altered by sclerosis will not produce a healthy ovum.

Future of Premature Children.—V. Wallich and A. Fruhinsholz (*Ann. de gyn. et d'obst.*, Nov., 1911) discusses the future of premature infants in relation to the right to cause premature labor in the interests of the mother. The first method of studying this subject is by observing the infant as he grows up; the second is by considering the adult who was a premature infant in the

beginning, and seeing what physical defects have arisen. The statistics that might come from hospitals are valueless on account of the inability to follow the child for any length of time. The author has taken his statistics from the histories given by various men who have observed their patients for years as family physicians. The premature infants are classified according to their weight at birth, and it is found that the results are less favorable according to the degree of prematurity and the obstetrical traumatism to which they were subjected. When these children survive they may remain depreciated in strength and growth, feeble mentally and physically, or they may be the prey of all sorts of intercurrent affections. Researches pursued from birth to adult life have shown that there are those who arrive at adult life and are physically and mentally normal; but there are also many who show various marks of degeneration, club-foot, hernia, incontinence of urine, nervous troubles, etc. Among degenerates there is an appreciable number of premature children; and their degeneration bears a relation to the presence of alcoholism and syphilis in the parents.

Repeated Cesarean Section.—John McGibbon (*Edinb. Med. Jour.*, 1911, n.s., vii, 513) records the performance of three Cesarean section upon the same woman, following craniotomy for contracted pelvis in a preceding pregnancy. At the time of the second section the uterine scar had disappeared and there were no adhesions. At the third section the scar of that which was performed eighteen and a half months before was observed as a fine linear depression, but there was no local thinning of the uterine wall and adhesions were absent. The patient was then sterilized by resection of the tubes. The writer discusses the literature justifying this procedure and that relating to repeated Cesarean section, its results and complications.

Treatment of Puerperal Infection.—B. Roxas (*Bull. Manila Med. Soc.*, 1911, iii, 168) advocates the systematic use of uterine drainage with the hard rubber tube in every case of puerperal infection. He records three selected cases to illustrate the grounds for this contention.

Cervical Pregnancy.—In recording a case of this type, I. C. Rubin (*Surg., Gyn., Obst.*, 1911, xiii, 625) states that to prove a genuine cervical placenta the following criteria are essential: 1. There must be cervical glands opposite the placental attachment. 2. This attachment of placenta to cervix must be intimate. 3. The whole or a portion of the placenta must be situated either below the entrance of the uterine vessels, or below the peritoneal reflection of the anterior and posterior surfaces of the uterus. 4. Fetal elements must not be present in the corpus uteri. The writer believes that his case meets these conditions. His paper includes a review of seven cases in the literature. This condition, which is practically a rare form of extrauterine pregnancy, is more likely to result in rupture than abortion on account of the relatively feeble muscular development of the cervix.

GYNECOLOGY AND ABDOMINAL SURGERY.

Ruptured Pus-tube a Cause of Diffuse Septic Peritonitis.—A. P. Stover (*Jour. A. M. A.*, 1911, lvii, 1694) says that spontaneous rupture of a pus-tube is a rare occurrence, and rupture followed by diffuse septic infection of peritoneum is still less common. In 1910, Lamouroux published seventy-seven cases besides one of his own. The writer reports two cases of diffuse septic peritonitis following the sudden evacuation of pus from a pyosalpinx. From the character of the adhesions in Case II, the process must have been of long standing. Case I was evidently a recent infection, as was shown by the adnexa being normal in contour, but slightly enlarged and thickened, and the adhesions being light and easily broken up. The treatment of a case of ruptured pyosalpinx is the same as that for acute diffuse septic peritonitis from any other source.

Uterosclerosis and Sclerosis of the Rectouterovesical Fascia.—According to J. Oliver (*Edin. Med. Jour.*, 1911, n. s., vii, 452) uterosclerosis or uterofibrosis is characterized by an overgrowth of the connective tissue of the muscular structure of the uterus. There is a marked increase, it may be in the connective tissue between fibers, but at all events in the connective tissue between bundles, with a correlative atrophy of the muscular elements, and consequently there may or may not be any very tangible increase in the bulk of the uterus. The atrophy of the muscular elements is in all probability secondary to the connective tissue overgrowth. This disorder may make its appearance at any time during the reproductive life, but is most commonly observed between the ages of thirty-five and forty-five. Sooner or later the sclerotic change involves also the fibrocellular tissue of the cervix. The chief symptom is metrorrhagia, but occasionally the change going on in the uterus inhibits the menstrual function and amenorrheic periods of five or six weeks are occasionally observed. In consequence of the defective muscularity of the uterus clotting of the blood may take place in the cavity of the uterus, and more or less organized blood clots are often expelled, and these products are apt to be viewed as remnants of a conception. The derangement is a true fibrosis, and does not appear in any way to be inflammatory in character. It may make its appearance many years after a full-time parturition or an early abortion, but the writer has been unable to associate the disorder with any septic agency occurring in connection with a full-time confinement or an abortion. Sclerosis of the rectouterovesical fascia is commonly a cause of infertility and even of sterility, as well as a not infrequent cause of dyspareunia. It resembles the disease known as Dupuytren's contraction of the palmar fascia. Sometimes the fascia is more or less thickened and contracted merely, but often it presents nodulations. It is not an inflammatory change, and it seldom, if ever, involves the mucous membrane of the vagina. The fibrous tissue causing the contraction is a

very coherent fibrillar tissue like tendon tissue. It is not dependent upon any traumatic influence, but is probably due to some bacterial product absorbed from the vaginal canal and circulating in the blood. It is a derangement which may appear at any time during the reproductive life of the woman after the age of twenty-one. It must not be confounded with puckerings of the vaginal roof dependent upon old adhesive peritonitis.

Peritoneal Adhesions—E. H. Richardson (*Ann. Surg.*, 1911, liv, 758) states that it is futile to attempt to banish abdominal adhesions, since the processes involved in their formation are identical with those concerned in peritoneal repair. In dealing with peritoneal adhesions, the surgeon has recourse to three classes of procedures: (1) measures which prevent their formation; (2) measures which restrict their formation to the harmless variety; (3) measures which aid in their absorption. Injury or death of the highly vulnerable surface endothelium is sufficient to set in motion the chain of pathological events which may terminate in dense adhesions. Etiologically, there are a number and variety of factors involved, but they can all be grouped under the two heads—sepsis and trauma. As specific prophylactic and curative measures, emphasis should be given to: (1) rigid asepsis; (2) the use of moist hot gauze; (3) careful covering of all raw surfaces; (4) avoiding unnecessary exposure; (5) restricting trauma; (6) gastroenterostomy and enteroenterostomy; (7) returning the viscera to their proper anatomical relationship; (8) spreading out the omentum over the visceral surfaces before closing the abdomen; (9) careful closure of the peritoneum. A number of additional safeguards are available which have been tested and proven to be of value under certain conditions. The most reliable of these for general use are: (1) viable grafts of omentum or peritoneum; (2) lubricants; (3) judicious ante- and postoperative therapy—especially with reference to posture, catharsis, enemata, and length of stay in bed. The field of specific chemotherapy offers the brightest hope for future progress.

Treatment of Acute Peritonitis.—Henri Hartmann (*Ann. de gyn. et d'obstét.*, Oct., 1911) says that from exclusively medical treatment applied to acute peritonitis, we have advanced to exclusively surgical treatment. By this means the results of treatment have improved during the past few years. It is now realized that the peritoneum has powers of defense against organisms which simply require aid in their action. This demands a precise and early diagnosis. In operating we need not attempt a complete cleansing of the cavity, which is impossible on account of its extent and the recesses connected with it, but may trust to the powers of defense of the peritoneum after evacuating the principal part of the infective contents, removing the cause of infection. The operation should be done rapidly and simply. The initial focus should be destroyed with the least possible interference. When drainage is indicated the tube should extend down to the bottom of Douglas' culdesac, and the patient be

kept in a half-sitting position. Slow injection of serum by the rectum is of signal service in after-treatment.

Treatment of Post-operative Septic Peritonitis.—In cases in which the patient has been returned to the ward in good condition, if within the first twenty-four hours the pulse begins to increase in rapidity until it reaches 130 or 140 or more, and if the patient vomits every now and again, after she should have gotten over the effects of the ether; if at the same time the temperature rises and the patient is restless and complains of abdominal pain, Hunter Robb (*Cleve. Med. Jour.*, 1911, x, 795) reopens and washes out the abdomen and introduces gauze drains. For an anesthetic, cocaine is often sufficient, but when needed, nitrous oxid gas adds practically nothing to the degree of shock. In cases where there is considerable pain after recovery from the effects of the anesthetic, if the condition shows no tendency to improve after the first twenty-four hours he institutes similar procedures. Generally the second operation can be carried out while the patient is in her own bed, and the shock is practically *nil*. The Kelly pad is put under the patient and the dressings are removed. The edges of the skin incision are slightly separated and from ten to twenty drops of a 5 or 10 per cent. solution of cocaine are applied to the tissues. The deeper stitches are then removed, and if the patient complains of much pain, more cocaine is applied or injected into the deeper tissues. The peritoneum having been incised, a two-way catheter is introduced as far down into the pelvis as possible and the cavity is flushed out with several quarts of sterile salt solution. Finally a strip of gauze is introduced as far down as possible into the cavity and the usual dressings are applied. If cocaine proves to be insufficient at any time nitrous oxid gas is administered to surgical anesthesia. A brief account is given of fifteen cases in which this procedure was employed with eleven recoveries and four deaths.

Operation of Schauta-Wertheim in the Treatment of Prolapse of the Genitals.—M. H. Violet (*Lyon méd.*, Oct. 29, 1911) has performed the Schauta-Wertheim operation ten times for prolapse of the uterus and adnexa with cystocele or rectocele. This operation is principally useful in elderly women, and should not be done during the child-bearing period unless the patient is at the same time sterilized, either by removal of the adnexa or cutting the tubes and covering their ends with peritoneum, so that impregnation is impossible. After this operation delivery of a child is impossible on account of the unnatural position of the uterus. At the same time it is an excellent method of keeping in place the prolapsed genital organs. It consists in anchoring the fundus uteri by an anterior colpotomy, and including and fixing the fundus in the vesicovaginal space which has been dissected for this purpose. The uterus thus keeps up the bladder, and is supported by a perineorrhaphy. If the uterus is too large for the position it is to occupy, it is reduced in length by

amputation of the cervix. If it is too small it will not support the bladder well. Absolute asepsis of the vagina and peritoneum are necessary; this is secured by painting with iodine. Spinal anesthesia with novocain is used. Recovery is uneventful, the patient leaving the hospital at the end of eighteen or nineteen days. The cure has remained perfect after six years' observation in one case. All the ten patients operated on were of the working class, and were able to continue their occupations with comfort. The operation is applicable to extreme degrees of prolapsus uteri with the adnexa drawn down, and with cystocele and rectocele.

Sensibility of the Pelvic and Abdominal Organs.—Ernst Engelhorn (*Zeit. f. Geb. u. Gyn.*, Bd. lxxix, H. 1, 1911) has made experiments on dogs as to the sensibility of the parietal and general peritoneum. He devised a graphic method of registering painful sensations in the animal by noting the changes in respiration. He concludes that the parietal peritoneum is sensitive to mechanical, thermal, and electrical stimuli; the visceral peritoneum of the large and small intestines is absolutely insensitive. Ligation of mesenteric vessels is not painful to dogs, nor is traction on the mesentery; the internal genital organs of the dog are insensitive; only traction on the uterine ligaments causes complaints. Animal experiments cannot be directly translated into terms of human physiology, but observations of the human race go to show that the conditions are similar.

Uterine Fibroid Causing Gangrene of Lower Extremity.—An unusual complication of uterine fibroid is illustrated by a case briefly reported by F. S. Crean (*Lancet*, Dec. 2, 1911). Death followed amputation at the knee for dry gangrene of the foot with subsequent extension of the gangrenous area. Autopsy showed a large subperitoneal fibroid almost occluding by pressure the right external iliac artery.

Radiotherapy of Fibromata and Glandular Atrophy Produced by the X-rays.—Foveau de Cournelles (*Gaz. de gyn.*, Nov. 15, 1911) thinks that the penetrating power of the x-rays is demonstrated by the ovarian atrophy which is seen after the application of the rays to the abdomen, whether in the treatment of fibroids with a view to reducing hemorrhage or to cause a premature menopause. The author thinks that the rays are indicated in derangements of menstruation and hemorrhages from the genital organs, especially at the menopause. They are also indicated in many cases of fibroids, which cannot be operated on. They are contraindicated in fibroids developed in the vagina, tumors undergoing malignant degeneration, and cases in which the symptoms are rapidly culminating. This treatment is in no way dangerous, and with correct technic, the use of penetrating rays, filtered, with intervals between the sittings, no skin burns will be produced. The reaction will never produce more than erythema, a passing tanning of the skin, and removal of hairs. In treating fibroids the hemorrhages are lessened and

the menses made less frequent, the tumors diminish in size, and in some cases disappear. Pressure effects are lessened and the patients are again able to take up their daily occupations. The author has proven that the ovaries, mammary glands, and lymphatic glands all atrophy under the influence of the x-rays. Whenever sterilization becomes necessary this method may be made use of. Painful ovarian diseases may be treated in the same way, the pain being relieved by the applications. Instead of a mutilating operation the painful symptoms are relieved by simple x-ray treatments at infrequent intervals.

Mechanism and Treatment of Prolapsus Uteri.—Hector Treub (*Rev. de gyn.*, Nov. 1, 1911) avows his belief that the most effective treatment of prolapsus uteri is that by a well fitting pessary. In speaking thus he means in all cases moderate prolapsus, when the uterus has not passed out of the vulva. The initial cause of prolapsus is generally a labor that has been followed by subinvolution, owing to the fact that the patient could not leave her work long enough to rest sufficiently. The vaginal wall slides downward under the pressure of the fetal head, even when there is no tearing of the perineum. When these injuries are not repaired the inevitable process of descent of the uterus beings. The bladder slides downward and then the weight of the contained urine aids in causing prolapse. Women of the working classes who are obliged to be on their feet a great deal, and to make severe efforts involving the abdominal muscles thus increase the trouble. If the uterus becomes retroverted, descent in easy, and the uterus drags down the posterior vagina wall. In some cases there must be also an abnormal relaxation of the ligaments and muscles supporting the uterus. The treatment of this condition is replacement of the uterus in a normal position and its maintenance with a properly fitting pessary. Practitioners who are unable to retain such prolapsus by means of a pessary do not know what kind to use or how to fit it. The author uses hard rubber rings, and circular plates perforated with holes, the pessary of Prochownik. The soft rubber rings produce a bad smelling discharge and should not be used. The only difficulty is to choose the right size of pessary to retain the uterus without putting the vagina too much on the stretch. It should be removed once in three months, and a douche should be taken every day. Suspension of the uterus by hysteropexy is not a good treatment of prolapsus, since it places the uterus in an abnormal position, and renders pregnancy undesirable and delivery impossible. This operation causes loss of blood, and is not without danger. Recurrence is possible and the repair of the perineum may cause the vagina to be so contracted as to cause difficulty in coitus.

Treatment of Uterine Myomata.—Richard Marek (*Monatschr. f. Geb. u. Gyn.*, Oct., 1911) states that a great change has taken place recently in the treatment of uterine myomata. Instead of the waiting policy that for so long held sway, operation

is considered to be indicated in most cases, as soon as marked symptoms of pressure or hemorrhage have shown themselves. Thus the patient has a much better chance of recovery than if left until marked anemia from hemorrhages reduces her strength and toxemia occurs from retained feces. At the present day it is agreed that every myoma that causes adverse symptoms should be removed. The operations that can be done are supravaginal amputation, and abdominal and vaginal total extirpation. The author tabulates the cases seen at Prossnitz from 1902 to 1910, showing that supravaginal amputation was done in the larger number of cases. By this operation seventy-five cases were operated on with one death. By abdominal extirpation twenty-six were treated, with one death. By the vaginal operation eighteen were treated, with one death. The primary results of total abdominal extirpation are not so good as those of the other operations. By far the best results are given by supravaginal amputation. Only in cases in women near the menopause is the patient left unoperated upon, and then she is warned that she should remain under the care of her physician as severe hemorrhage may take place. Myomata of the cervix were always operated on. The adnexa were removed in the supravaginal amputations. Abdominal total extirpation is indicated when the myoma is undergoing degeneration into a malignant tumor; in cervical myomata; when adhesions to the neighboring organs render it impossible to remove the tumor without tearing them; and when complicated with purulent collections in the adnexa. In pregnancy operation should be done when the tumor is growing rapidly and there are pressure symptoms; when the tumor is likely to cause a premature delivery; when there is danger of peritonitis; in cervical myomata; and in polypoid myomata. X-rays may be used when operation is refused; when heart or kidney disease contraindicates operation; in hemorrhage at the climacteric; and in patients depleted by hemorrhage.

Control of Hemorrhage from Inoperable Neoplasms of the Bladder.—L. B. Bangs (*Med. Rec.*, Aug. 19, 1911) records excellent hemostatic results from vesical injections of creolin, $1/4$ to $1/2$ per cent., at a temperature increasing as tolerated, from 100° to 105° F. given daily at first and later with decreasing frequency up to every third or fourth day. It was at first retained twenty or thirty minutes and later indefinitely.

Occurrence of Carcinoma in Cystic Teratomata of the Ovary.—H. Williamson and J. Barris (*Jour. Obst. Gyn. Brit. Emp.*, 1911, xx, 211) say that the majority of cystic ovarian teratomata are innocent tumors, while the majority of solid ovarian teratomata are intensely malignant. Occasionally ovarian dermoids are malignant, being either carcinomatous or sarcomatous. The writers review the recorded cases, excluding those which they regard as doubtful and report four cases of squamous-celled carcinoma arising in ovarian dermoids.

M. J. Stewart and C. Eglington (same, p. 230) record a case of multilocular ovarian cyst containing teratomatous, sarcomatous, and papillomatous elements.

Sclerosis of the Ovarian Vessels.—Cesare Decio (*Folia gyn.*, vol. vi, fasc. 1, 1911) finds that in infants the structure of the ovarian vessels is always normal, while in adults and old women there are present extensive alterations of the vessels, which may be divided into three types. In the first type, found in the vessels of medium caliber in the hilum, there are degeneration and disappearance of the muscular tunic, for which is substituted hyaline connective tissue. This is the common process of arteriosclerosis and involves only the intima. This alteration begins at about the thirtieth year and increases with years. There is also found in the vessels of the cortex, involving the internal coat, a process characterized by destruction of the muscular coat, hyaline degeneration, and deposit of an elastic substance, derived from normal elastic tissue, called by Unna collastina. The second sort of change is parallel to the normal involution of the corpus luteum, not dependent on pathological conditions, and probably due to the same cause as such involution. A third type is a true sclerosis of the vessels and is not characterized by hyperplasia, but by degeneration solely. The author examined the ovaries of twenty individuals varying from fifteen to fifty-five years of age.

DEPARTMENT OF PEDIATRICS.

INTRATHORACIC TUBERCULOSIS IN INFANCY AND CHILDHOOD, BASED UPON THE STUDY OF 125 CASES.*

BY

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IN a previous paper(1) I gave the reasons for using the term "intrathoracic" rather than pulmonary in a discussion of this kind. Prof. Vargas(2) of Barcelona puts the facts concisely by saying, "It is now generally admitted that particularly in children the first stage of thoracic tuberculosis is always in the lymphatic nodes." In other words, when we limit our diagnosis and treatment to actual pulmonary lesions we wait for the second stage of intrathoracic tuberculosis before attempting a cure. Probably the only exceptions to this rule are the cases of acute miliary tuberculosis of hematogenous origin. These are the result of the sudden invasion of the blood stream by a large number of virulent tubercle bacilli. This blood infection is almost invariably produced by the emptying of a broken down tuberculous lymph node into the arterial circulation.

Frequency.—It is exceedingly difficult to form any definite conclusions in regard to the frequency of active clinical intrathoracic tuberculosis in the young. We have four classes of statistics which bear upon the subject more or less directly.

1. Autopsy findings.
2. Case reports of institutions, and departments of health.
3. Series of tuberculin tests in institutions and in clinics.
4. Systematic examinations of the children of tuberculous parents. It is an obvious fact that institutional statistics, particularly in relation to a disease like tuberculosis, have only an indirect bearing upon the prevalence of the disease in the community as a whole. This is also true of statistics in regard to the children of tuberculous parents. Furthermore, mortality

* Read before the Brooklyn Medical Society, Dec. 15, 1911.

statistics give us no clue as to the number of persons infected during childhood and recovering or only showing an active process in later life. Even the large series of statistics of von Pirquet tests are as yet of little value in regard to the community as a whole for the reason that they all refer to investigations among the classes most likely to be infected. Some day the community will realize the value to the individual of a yearly tuberculin test among all classes. Under these conditions we would know when a child passed from a negative to a positive phase and he would receive promptly the special hygienic supervision which would render such an incipient infection harmless. Even such figures, however, would not indicate how many children had an active intrathoracic lesion.

Theoretically the statistics of reported cases ought to be authoritative. It is probably true that in New York City nearly all cases of pulmonary tuberculosis are reported when recognized. Unfortunately many of these cases in children are not seen by physicians in the early stages and still more unfortunately they are not always recognized. The results of school inspection as it is at present conducted, are of course unreliable.

The Department of Health of New York City has recently tabulated the recorded cases that are living at that date, but they are not supposed to be at all authoritative in regard to conditions during childhood. If time permitted there are a number of questions suggested by these figures which would be worth discussing. I will mention only a few in passing.

CASES OF PULMONARY TUBERCULOSIS ON HEALTH DEPARTMENT
REGISTER OCTOBER, 1, 1911.

	Total	Uncared for
Manhattan:		
Under 5 years,	113	26
Between 5 to 15 years,	1067	260
All ages,	21366	3339
Brooklyn:		
Under 5 years,	75	40
Between 5 to 15 years,	749	365
All ages,	7885	3119

First: The very small number of cases under five years. This, of course, does not give any real indication of the relative frequency for the reason that in young children active pulmonary

tuberculosis is an acute process of comparatively short duration. The number of cases on record at a given date would therefore be proportionally less than the number of more chronic cases in older people.

Second: Brooklyn had a total under fifteen years of 824 cases out of a total at all ages of 7885, *i.e.*, 10.5 per cent., whereas Manhattan has a total of only 1180 under fifteen years out of a total of all ages of 21,366 or about 5 per cent.

Third: Brooklyn has at home and uncared for 495 cases under fifteen years, while Manhattan has but 280 in the same condition.

The mortality rates at different ages in Greater New York were given by Guilfooy at the Sixth International Congress(3) as follows:

Age periods	Death rate per thousand Pulmonary tuberculosis	Living at that age	
		Male	Female
Under 5	.45	.45	.46
5-9	.18	.19	.17
10-14	.33	.15	.51
15-19	1.57	1.65	1.50
45-54	5.58	2.65	1.99

The chief point of interest here is the very low rate from five to nine years. This has a practical bearing on prognosis and will be discussed later.

It is very difficult to draw definite conclusions from the autopsy statistics of different investigators. According to Holt(4), Müller of Munich found tuberculosis in 40 per cent. of 500 autopsies in children—age not given. In 30 per cent. death was due to tuberculosis, too high a figure to be derived from consecutive autopsies upon miscellaneous cases. Holt's own figures give a death rate of 6 per cent. in 726 consecutive autopsies at the New York Infant Asylum; and in 319 autopsies at the Babies' Hospital 14 per cent. were found to be tubercular. These figures are not comparable as one is a death rate and the other autopsy findings. As the lungs are almost invariably affected in young children with active lesions this means that 4 per cent. had pulmonary tuberculosis. Froebélius(5) found that between 1874 and 1883, 4 per cent. of the 18,000 deaths under four months of age in the St. Petersburg Orphan Asylum were due to pulmonary tuberculosis.

A good deal of an indefinite nature has been said in regard to the frequency of tuberculosis in the children of tuberculous parents, but figures are scarce. Miller and Woodruff(6) give the results of the careful examination of 150 such children as follows: Seventy-six children, 51 per cent., were positively tuberculous; thirty-one, 20 per cent., were suspicious; the other 29 per cent. were apparently normal. No conclusions in regard to all social classes can be drawn from these figures because the children examined are from the dispensary class, that is, the crowded class. Many other figures might be quoted indicating in a general way that pulmonary tuberculosis is a very frequent cause of death in the first two years of life and that the cases increase in number in later years in spite of the fact that the death rate is somewhat lower. Klebs(7) says, "The view that tuberculosis is eminently a children's disease, something like measles, producing fatal results at once in early childhood or an increased resistance against evil influences in later years, wins more and more adherents during the last few years."

Sources of Infection.—Nothing would be gained here by taking up the various ramifications of the Behring-Koch controversy in regard to the relative importance of bovine and human strains of tubercle bacilli, or the question of infection by ingestion or by inhalation. Park(8) has shown that the bovine type is the infective agent in a very considerable number of gland, bone and meningeal infections in young children. Kossel(9) sums up the number of cases of pulmonary tuberculosis in which the type has been differentiated as two bovine and 707 human.

During the last nine years we have witnessed one of those pendulum-like changes in theory to which the medical profession seems remarkably prone. Before Behring's pronunciamiento at Cassel, in 1903, it was generally assumed that pulmonary infection was by inhalation. For five or six years after that date we were flooded with the proofs that infection was by ingestion and that infection by inhalation was an impossibility. We have in the last two or three years had time to partially digest the accumulated facts and arrive at the conclusion that primary infection occurs in either tract and that the younger the child the greater the probability of infection by ingestion.

During this same period we have also learned according to Schlossman(10) that the number of both hereditary and congenital cases of tuberculosis is much greater than had been taught previously. Although the number of such cases is not

large it forms an appreciable percentage of the cases during the first two years of life.

Paths of Pulmonary Infection.—The fact that pulmonary infection is almost invariably secondary to an active process in some of the deep glands of the thorax, is so generally accepted that no authorities need be cited. The glandular anatomy of this region will be discussed later. It is true that there is a small percentage of cases which apparently develop by direct inhalation infection of the mucous membrane of the small bronchioles, without primary glandular infection in the region. It is also true that acute miliary infection of the lungs may occur through the blood stream (hematogenous infection) from extrathoracic lymph nodes. In practically all such cases, however, the other organs of the body, brain, spleen, liver, are equally the seat of the miliary infection. In one such case, a female of eight years, the mesenteric glands were the seat of primary infections and the child apparently died of meningitis. The autopsy revealed a rapidly caseating miliary tuberculosis of both lungs and brain, both cerebrum and cerebellum were filled with similar multiple tubercles. This brings us back to the first statement in the paper that for the most successful treatment of pulmonary tuberculosis we must recognize it before it is actually pulmonary.

Diagnosis and Types of Disease.—In children the diagnosis of intrathoracic tuberculous lesions even in typical second stage cases must not be made hurriedly. Much greater accuracy will be attained and the process will readily be facilitated if it is divided into two steps: first, a careful determination of the lesions which are producing the various symptoms; second, the decision as to whether those lesions are due to tuberculous infection. For example, in nurslings the usual type of the disease as we see it is a rather diffuse bronchitis or later bronchopneumonia. In a majority of cases it is impossible to determine whether we are dealing with a simple pneumococcus or mixed infection with tuberculosis. In a majority of tuberculous cases the lesions are more markedly unilateral than they are in most other pulmonary infections, but this is a generalization with many exceptions on both sides.

While we may be suspicious of cases of bronchopneumonia or bronchitis that run over three or four weeks, we must remember that the influenza bacillus in combination with the various pyogenic organisms will produce an infection of the respiratory tract that may last for many weeks and then clear up quite rapidly.

In such cases, however, the temperature is apt to run a much higher course than in tuberculosis. In these young children a positive von Pirquet reaction is fairly conclusive evidence, but a negative test may be due to the severity of the process. A careful investigation as to a possible source of infection will sometimes be of aid in diagnosis, as tuberculous infection during the early years can be traced to its probable source in a majority of cases. Two cases in private practice may be cited as illustrations.

R. C., male, three months, birth weight 9 pounds. Weight at three months, 12 pounds. Nursed two months then bottle fed on account of mother's poor health. First seen on account of a cough which had developed three days earlier. I found a moderate bronchitis much more marked on the right side than on the left. In a few days developed a right side bronchopneumonia. There was considerable improvement for a week, but the process did not entirely clear up and the child died two months later of a tuberculous meningitis. In this case a caseating lymph node probably eroded into a vein and the tubercle bacilli were carried through the heart into the general circulation with a resulting miliary infection of the meninges. In my experience this terminal meningeal infection is a very frequent direct cause of death in young children with pulmonary tuberculosis.

Another case: Male, aged fourteen months; large, well-nourished child, absolutely no family taint. Boy had been treated for pneumonia by another physician, and reported cured. He continued to cough. Examination showed what appeared to be a resolving lobar pneumonia of the upper right lobe. Although the actual solidification cleared up the bronchitis extended to both lungs. He was removed to the country where he had come from but died about three months later. I learned subsequently that he had been a bottle fed baby fed upon one cow's raw milk. About the time that I first saw him the cow had shown evidences of serious illness and had been sold surreptitiously to a slaughter house in Jersey City.

Both these cases illustrate the more acute type of tuberculous bronchopneumonia of infancy. More rarely there is seen the more chronic type resembling the subacute tuberculous bronchopneumonia of adult life. On the seventh of this month I performed an autopsy upon a female child of two years and eight months. The mother had died of pulmonary tuberculosis shortly after the birth of the baby. At eight months of age the child had shown evidence of pulmonary trouble and a diagnosis of tuberculosis had been made soon after. There had been more or less "lung trouble" ever since. At about eighteen months an otitis media had developed and then a mastoiditis which

had been operated but never healed completely. An organism which has the morphological appearance of the bovine tubercle bacillus was recovered from the ear discharge. It is now undergoing the process of differentiation.

This was a small but fairly well nourished child. She was in the Home for Consumptives for thirty days before death and gained over a pound; weight on entrance fifteen pounds. The temperature had ranged between 100 and 100.5.

The autopsy findings were briefly as follows:

Skin pink and healthy. Body fairly well nourished, very little subcutaneous fat. Liver extended to the anterior superior spine on the right side and to the junction of the ninth and tenth costal cartilages in the left mammary line, a large amyloid liver. The kidneys had also undergone some amyloid degeneration. The mesenteric lymph nodes were enlarged—varied in size from a large bean downward. They were not broken down at any point—recent infection. Other abdominal organs normal.

The pericardium was thickened and adherent to the lungs. The heart was normal, except that the right ventricle was dilated. Both lungs were adherent to the pleura and to the diaphragm, but the lesions of the right were more marked throughout than those of the left. Both apices contained numerous old calcified tubercles. In addition both lungs were involved in a general lobular pneumonia with a few small cavities filled with pus, and one cavity in the upper right lobe one inch by three quarters by a half. The mediastinal glands were much enlarged, caseating and adherent to both lungs and to the pericardium.

The child evidently had an early infection of both apices from which there was at least a partial recovery. Secondary to that there was a general infection of both lungs. Apparently the earliest lesions in this case were in the apices and not in the bronchial glands, but the extensive and mixed nature of the changes made an accurate determination impossible. The infection of the mesenteric lymph nodes was much more recent, due to swallowed sputum.

In children of five and over the process is not usually so acute and resembles as a rule the pulmonary tuberculosis of adults. This may be due to a survival from early infection of those patients with greater resisting power in proportion to the virulence of the infection. A fact which favors this idea is that in some instances at least of the very acute type in older children there is a history of recent exposure, while the more chronic

cases give a less definite history of early exposure. Closely related to this idea is the much debated question as to whether "scrofula" produces an immunity to tuberculosis.

Although the acute tuberculous lobar pneumonia described by Osler and others is very rare in my experience in children, it does occur and must always be considered in cases of unresolved pneumonia. The following case illustrates this type.

E. H., male, ten years; source of infection not determined. Until one month before admission to the Home was apparently normal. At that time he developed a typical lobar pneumonia. It did not resolve, tubercle bacilli were found in the sputum and he was transferred to the Home.

On admission he had complete consolidation of the middle lobe and partial consolidation of the upper and lower lobes on the right side. (It is to be borne in mind that the middle part of the lung is the most frequent seat of tuberculosis at this age.) After admission the lung broke down very rapidly and a very large cavity developed. The temperature was of the so-called septic type and ranged between 97 and 104. In spite of the very acute type of infection this boy gave very definite von Pirquet reaction. He died seventy days after admission. No autopsy was obtained.

Thoracic Gland Infection.—This is such a large and important subject that it cannot be given any adequate discussion in this paper. If actual pulmonary lesions are practically always secondary to infection of these various lymph nodes, accurate diagnosis at this stage is of the utmost importance for the best results. Nevertheless, I think it is correct to say that a very small percentage of practitioners to-day have had enough experience in the physical examination of children to recognize the slight changes that suggest enlargement of these glands. Furthermore, among those who have given much time to the study of this subject there is wide difference of opinion as to the value of the various signs described by different investigators. Some years ago Eustace Smith(11) wrote quite extensively upon the signs of pressure on the veins of enlarged glands in the hilus region. He lays great stress upon the paroxysmal cough somewhat resembling pertussis; dullness over the upper part of the sternum; and a venous hum heard at this point when the head is forcibly retracted. Hollopeter(12) agrees with him as to the value of these signs. Most writers, I think, will agree with me that sound changes in this anterior part of the chest cannot be produced until the glands are of very considerable size. In my experience in all such cases the lungs are already definitely

affected. The paroxysmal cough, provided it is not produced by adenoids or other irritation in the upper air passages, accompanied by the systemic signs of some wasting disease, is to my mind an indication that a child should be given the benefit of the doubt as to treatment, that is, proper treatment.

Probably the earliest signs of infection in these glands are to be found in the region of the upper dorsal vertebræ. D'Espine (13) pointed out the fact that normally the tracheal quality of the respiratory sounds ends quite sharply at the seventh cervical vertebra. You can easily confirm this in your office work. In case of enlarged glands this tracheal quality is present over lower vertebræ, and broncophony will be found in connection with it. Stoll (14) says: "In an adult in whom the diagnosis of enlarged bronchial glands was substantiated by radiogram, vertebral broncophony extended to the second lumbar vertebra."

Percussion both on the spine and close to it has been studied by Kramer (15) and others, and is of value if promptly performed. It must be remembered that a dull note is normal over the upper four thoracic vertebræ, below this dullness is pathological. In children light para-vertebral percussion is more satisfactory and is undoubtedly of diagnostic value.

Tuberculin Tests.—It is generally admitted that the younger the subject the more useful is the tuberculin test and that children under three months do not react. In a vast majority of cases the von Pirquet test is the one employed. This may be followed by the endodermic method for further confirmation of a negative result. The reason that age is to be considered is that the younger the individual the greater the probability of a positive reaction being due to an active process. I am of the opinion that the more one uses this sign the more he will recognize its value in connection with other evidences of tuberculosis. It invariably means some form of tubercular process in the organism, but no more than that is claimed for it.

Prognosis.—The prognosis in intrathoracic tuberculosis at any age depends upon many factors, the most important consideration being the stage of the disease. In the incipient or pre-pulmonary stage when the infection is confined to the glands the probability of recovery under proper treatment is excellent. Even during the first year our apparent high death rate may be due to a failure to recognize any except active pulmonary lesions. Whenever we begin to give accurate systematic attention to the infants of tuberculous parents, our figures may be quite different.

When definite pulmonary lesions are present, age is a very important factor in the diagnosis. It is undoubtedly true that the prognosis under three is very bad. Nevertheless I must disagree with most other observers in their extreme views. Bonney is quoted by Craig(16) as saying "No child under eight years has secured an arrest of pulmonary tuberculosis while under my supervision." From my own experience I am convinced that this quite general belief is due to the fact that a great many milder cases escape definite diagnosis. The specialist sees as a rule only those cases that grow progressively worse.

Even an infection occurring before the first year may be at least arrested as the following case will show.

L. R., male, two years and three months. Father, active case in the Home. Mother at Otisville. Three other children well. A history of frequent attacks of bronchitis since the age of four months. Pronounced tuberculous at nine months. Examination on admission showed moist râles and slight dullness in the middle areas of both lungs.

A von Pirquet test gave a very pronounced reaction.

The active process cleared up very rapidly although there were exacerbations, when fine moist râles would appear along the border of the left scapula.

Patient discharged after 235 days to go to the country.

Following the high mortality of infancy and early childhood there comes a period of comparatively low mortality running till ten or eleven. This does not seem to have been recognized by many writers but statistics bear me out in this belief. In Guilfooy's figures previously quoted, the death rates are as follows: under five, .45; five to nine, .18; and ten to fourteen, .33. This may be due to high death rate in earlier period, or to an increased resistance at this time. Whatever the cause, I am convinced that the prognosis from four to eleven years, even in moderately advanced cases is more favorable than at any other time of life, provided the treatment is actually and not theoretically what it should be.

According to Craig in the paper previously referred to, the prognosis is better between ten and fourteen years than in the earlier period. Here again my experience is different and Guilfooy's figures are in my favor. This increase in mortality is due to the stress of development at puberty and is much more noticeable in girls than in boys. Klebs says, page 83: "Influence of sex: Females at the time of menstruation, pregnancy and parturition are physiologically less resistant . . . Analogous

physiologic changes in the male have not been associated with tuberculous infection."

Not only do Guilfooy's figures show the higher rate at this period but the difference in sex is very marked. Up to ten years the rates for the sexes is the same, but in the ten to fourteen year period the rate of males is .15 and that for females is .51.

Treatment.—In what has been said about the prognosis I have assumed that the treatment is properly planned and fully carried out. Unless this is the case the prognosis is distinctly worse at all ages of childhood than in later years.

All rational treatment in tuberculosis is administered with the object of maintaining and increasing the various steps of metabolism, digestion, assimilation and elimination. Even the therapeutic use of tuberculin may be classed in this way for its usefulness is due to its stimulating effect on cell activity. All attempts thus far to directly attack the tubercle bacillus have been failures or worse, and most of them have been founded on fraud or ignorance. It follows, therefore, that if the desired effect can be secured without the use of drugs, drugs are contraindicated, for there is no drug in the pharmacopeia without its drawbacks. The use of codein and heroin for cough is so bred in the bone with members of the medical fraternity that we find it difficult to get away from them. But opium and all its derivatives definitely retard metabolism and are therefore emphatically contraindicated unless we are positive that the exhaustion or nerve irritation of coughing, is more harmful than the drug. Remember that the patient is no judge of this question. In children enlarged tonsils and adenoids may be the chief causes of the cough, and should, of course, be removed unless this is contraindicated by the general condition.

The best sedative for cough is cold air, that is, constant cold air. Sudden changes in temperature will often excite coughing temporarily; if the patient *lives* in cold air this will be avoided. It is usually difficult to convince adult patients of this fact, but with children in an institution we can do as we please. As a rule the cough is most troublesome when the children go to bed, probably on account of the change in posture. The morning cough is not usually as troublesome as in adults. When the children at the Home are put to bed there is about half an hour of enough coughing to get on the nerves of any new nurse who comes on duty. For the rest of the night the dormitories are very quiet.

Creosote and its derivatives are used as a matter of course by

most physicians in the treatment of tuberculosis. Robinson and many others give excellent proof of their efficacy. I have in the past prescribed a large amount of creosote carbonate, thiocol et al, but I can see no change in our results since they have been discarded, except perhaps better appetites in some instances.

In the past when new arrivals showed poor appetites, anemia, etc., we gave simple bitter tonics and some iron, and were pleased with our therapy when the patients "picked up." I notice that the appetite and the color in the cheeks appear just as quickly now without medication.

What our patients do get may be summarized in three words: air, food, and water. Few physicians and fewer of the laity yet realized what fresh air treatment really means. Our dormitories each have over one hundred square feet of doorway opening onto a ten foot porch. Some of the children sleep in the dormitories, some on the porch. There is one steam radiator in each dormitory to increase ventilation rather than for heating purposes.

The few children not well enough to be in the yard spend the whole day on the porch. The only part of the twenty-four hours spent in a warmed room, that is, between fifty and sixty in the coldest weather, is the time in the dining room. I still cling to the theory that external heat aids digestion. In a partially enclosed summer-house in the yard we have a branch public school. The children, a few at a time, have short periods of instruction, and the rest of the time play in the yard.

The feeding problem is much simpler in an institution than in the home, because we do not have the preconceived notions of the parents to contend with. A majority of our patients come in with a history of no appetite, inability to eat eggs, drink milk, etc. In less than a week even the two and three year old children are gulping two whole raw eggs a day and drinking from two to four pints of milk. We never give cooked eggs and we never give them in milk. If they are to be taken over a long period it is best to give them alone. In addition to this they have a varied and rather coarse solid diet—meat, fish, vegetables, flour food, cheese and fruit. About once a week they have their favorite dinner, corn beef and cabbage. In private practice we could hardly go as far as this, but we are dealing with children who have been brought up on coarse food and I am convinced that it plays an important part in elimination. At any rate we never have indigestion to deal with and children

whom I know have been vomiting after every meal before admission soon settle down to enjoying every part of this diet. In the middle of every afternoon they have a rich home made ice cream. We use no fats and no proprietary foods.

Elimination.—Physicians sometimes forget how important a part the skin plays in elimination, particularly in children. It takes from one to four warm scrubs to get these children cleaned down to the good pink epidermis, and then they are kept clean. Of course, each one has a tooth brush and uses it twice a day. For the bowels we use castor oil as needed and rather freely.

Tuberculin.—As I have given my views in regard to the use of tuberculin in a previous paper, it is unnecessary to go into details here. It is not indicated in the large number of early cases which show immediate rapid improvement, and it is distinctly contraindicated in the acute cases already overwhelmed with toxins. It is of the greatest value in the more chronic cases which have shown some improvement and yet stop short of satisfactory result. I believe in the rather frequent minute dose as recommended by Trudeau, less than one thousandth of a milligram to begin with, and I consider a definite reaction an indication of over dosage.

Results.—Our results have been already indicated in what has been said about prognosis. The most notable change after admission is the gain in weight and improvement in appetite. Even the hopeless cases show this at first. The baby previously mentioned, who died after thirty days in the institution with typical third stage lesions gained one pound. At the same time we get the drop in temperature, due, of course, to improved oxidation and elimination. We have had in the Home for nearly two years a pretty little dark, brown-eyed, rosy-cheeked Jewish girl. She is now a little over four years old. Practically the whole of the left lung and part of the right were involved on admission. Soon after admission a cavity appeared on the left lower lobe, apparently cicatrized and has now broken down again. After the initial improvement her lesions have been progressive. On casual observation she looks like a healthy child. She has a good appetite and plays in the yard with the other children most of the day. Her rectal temperature occasionally reaches 101, but not often. One of these days she will develop an acute miliary infection, perhaps in the meninges and go off quickly. I am fully aware that by all the traditions of tuberculosis treat-

ment this child should be kept at rest all day. Racing about the yard indicates gross carelessness on the part of the attending physician. As a matter of fact, in her case, and in others, forty-eight hours confinement on the porch produces loss of appetite, loss of weight, and loss of sleep at night.

The conclusions presented in this paper are based almost entirely upon the study of the 130 cases that have come into the children's wards of the Brooklyn Home for Consumptives during the last two and a half years. This means that the results have been obtained under the most favorable circumstances. If children are to be made well they must be made happy. To cure tuberculosis we must improve the environment and the more we can improve the environment the greater the probability of a cure. When we take a sick child from a crowded tenement full of other children, noise, dirt, and the stale smell of food, wash her and dress her in clean clothes and put her among a group of happy clean children ready to greet her as a sister; when she sits down to an inviting meal in a clean, airy dining-room and sleeps in a clean, sweet bed with the air of all out of doors about her, the improvement in environment is so much greater than can be made among well-to-do people that the results must be correspondingly greater. How we are to get a corresponding stimulus toward happiness and health for children who take all these things for granted is a difficult problem.

Of the 129 children received in the Home ten were discharged as probably not tuberculous. Of the remaining 119, seventy-four were female and forty-five male. Of these twenty-two were under five years; thirty were between five and ten years; sixty-one were ten to seventeen years.

In the first period, up to four years, there were five deaths. This low rate being due to the removal of some cases before death, and also to the fact that we receive some cases of glandular tuberculosis with evidence of involvement of the bronchial glands. In the second period we have had two deaths among thirty patients. This period of low death rate really extends to the twelfth year and includes twenty cases in the tenth and eleventh years.

During the twelve to seventeen year period we had forty-one patients; twenty-eight girls and thirteen boys. Of these ten died—nine girls and one boy.

The one patient who was admitted at the age of seventeen years has been with us nearly a year and verifies my opinion that girls do well as long as menstruation is delayed. She came to the

Home from the Rockefeller Institute. She had a greatly hypertrophied heart, a loud mitral systolic and an aortic murmur and was in an advanced second stage of tuberculosis with the sputum loaded with tubercle bacilli. Judging from physical signs there has been no improvement, but she has gone from seventy-three pounds to ninety-five pounds, her temperature by rectum never reaches a hundred and she is as rosy and bright and happy as any fat little twelve-year-old girl that I know. When she first came she had considerable cardiac dyspnea, but that has entirely disappeared.

SUMMARY.

1. There are no data available at present to indicate how general pulmonary tuberculosis is among children in all classes of society.

2. It is possible, with reasonable certainty to make a diagnosis of thoracic gland tuberculosis in children before the lungs are actually infected.

3. In the prepulmonary stage the prognosis is fairly good at all ages in children.

4. In pulmonary infection the prognosis depends to a considerable extent upon the age period, being best between five and eleven years.

5. During the period of sex development the prognosis is about three times as bad among girls as among boys.

6. Success in treatment depends more upon twenty-four hours a day in the open air than upon everything else.

7. Tuberculin is distinctly beneficial in certain selected cases.

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- 137 CLINTON ST.

DIAGNOSTIC SIGNIFICANCE OF RIGIDITY OF THE NECK MUSCLES IN CHILDREN.

BY

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IN a large consulting practice I find that there is so much emphasis placed upon the one symptom of muscular rigidity of the neck, particularly as an evidence of the existence of meningitis, that it has seemed wise to discuss this isolated symptom from a practical standpoint—from the standpoint of its diagnostic value.

A contracture of the muscles of the neck which results in a stiffening or rigidity of that part of the body, or which may be severe enough to result in complete immobility of the neck, is not infrequent during childhood. The degrees of the contracture vary within wide limits, the slightest degree being that in which the head is extended and passive motion is rebelled against, but at the same time the head is not thrown out of its natural position. In this form every attempt at enforced movement is accompanied by evident pain, at which the little one very naturally rebels. It is a simple matter to test the presence of the condition, for even with the mildest type of contracture, if the child is recumbent and an attempt is made to bring the head forward, there is pain, while in a normal condition there is no difficulty (and certainly no pain) in the procedure.

It must be remembered, however, that under perfectly normal conditions, that the mere placing of the examiner's hand under the head will place the child upon its guard and when forward motion of the head is attempted, there will be a voluntary stiffening of the muscles of the neck. This is eliminated by attracting the child's attention to something else while the hand is still under the head.

If a contracture of this mild degree occurs in the course of meningitis and the child is somnolent, the effort to bring the head forward is difficult and the child gives evidence of pain. In the more severe degree the head is drawn and fixed to one side or may be forcibly drawn backward.

When one considers the diagnostic value of this form of contracture it is advisable to distinguish between the acute form and the chronic.

Acute Forms of Contracture.—The acute forms are most commonly associated with the different forms of meningitis, and the origin of such contracture is undoubtedly a tonic spasm of the musculature of the nape of the neck, which, in turn, is caused by an irritation of the anterior cervical nerve roots. When the meningeal inflammation is localized, or most progressive in the occiput, rigidity of the neck muscle is always prominent.

The presence of backward contracture is usually first evidenced by the marked hollow which is present in the pillow upon which the child's head has rested. Children often assume apparently uncomfortable positions, and it is common to observe them with the head drawn back, but there is not the hollowing out of the pillow unless the contracture is persistent. Of all forms of meningitis, contracture of the neck muscles is the earliest and most constant in epidemic cerebrospinal meningitis. No matter how slight the effort to bring the head forward, the child rebels, and if the act is persisted in, there is unmistakable evidence of pain. And in mild instances of muscular rigidity there may only be opposition to passive forward or lateral movement of the head, or to its rotation. But such opposition is the result of reflex action from pain. The fact of muscular rigidity need not then be demonstrated, for it is just as valuable a sign if we have opposition to passive motion, this latter being merely a minor symptom due to the same causes as the former. In demonstrating hypertony, it is exceedingly important that some of the commoner causes of muscular rigidity of the cervical and spinal regions be absolutely eliminated. Muscular rheumatism might under certain favorable conditions prove misleading for a time. Enlarged glands are so painful particularly when the inflammatory process is deep seated, and the enlargement does not appear prominently, that the child holds the muscles rigid. In infants the possibility of scurvy must be remembered, although the history of faulty feeding would always suggest it. In the various infections occurring during childhood, it is not an uncommon experience to find muscular rigidity a more or less prominent feature, and clinically this rigidity is not distinguishable from that which occurs in many cases of meningitis. It will thus be observed that muscular rigidity which has been given such a prominent place in the symptomatology of meningitis is as uncertain and as

unreliable a symptom as the rest, and if given too much emphasis will prove misleading, and further than this, it must be remembered that muscular rigidity does not invariably occur in meningitis. As the musculature is palpated, it is observed to be hard and unyielding.

The symptom is so early and so constant in the epidemic form of meningitis that it is unmistakably present in a child who has been ill for thirty-six hours or less with symptoms of high fever and intense headache, and these have been present from the onset, the diagnosis of epidemic cerebrospinal meningitis is probably without further symptoms. If there is associated with these symptoms a marked pain in the back, which is more marked when a change is made from the prone to the upright position, the diagnosis is almost certain. One must be positive, however, that the child was well for some days previously, and that the onset was sudden with all symptoms severe from the very first.

On the other hand, if the onset of the symptoms was apparently sudden, with an illness of a few days preceding, in which there was vomiting which was persistent and without apparent cause, and associated with slight fever and perhaps constipation, then the evidence would strongly favor a diagnosis of tuberculous meningitis.

During the course of meningitis, if there has been a contracture of the musculature of the neck and coma supervenes with a considerable degree of relaxation of the muscles, it is a sign of grave import, indicating an early fatal result.

When a contracture of the musculature of the neck occurs during the second week of an illness in which there has been a decided elevation of the temperature without persistent vomiting, then a diagnosis of some form of meningitis would be doubtful, even though the child was in a state of delirium or of somnolence. Such a condition would be much more suggestive of relapsing fever or of serious typhoid. By the second week in either disease there would more than likely be present other corroborative signs. Brudzinski's sign as an evidence of meningitis has some value, although it does not in any way differentiate the several types. It consists of reflex actions evidenced by what are called the "neck sign" and the "leg sign." The first is the one in which we are interested and is elicited by forcible flexion of the head upon the chest and coincident with this motion there occurs a reflex in the legs and arms which assume definite positions. In meningitis the neck sign is most

constant and is really a refinement of the ordinary rigidity. However, the sign may be present in conditions which severely affect the nervous system, irrespective of meningitis and may be entirely absent in cases of meningitis.

In the leg sign, passive flexion of one leg causes its fellow to flex also and remain in a similar definite position.

The retraction of the head which is associated with general muscular spasms, as is observed in cases of tetanus and in poisoning from strychnine, must be differentiated.

Torticollis is a common form of acute contracture and is generally produced by the contraction of one sternomastoid muscle. Associated with it there is usually some spasm of the posterior cervical muscles and the trapezius. There are various degrees of deformity, depending upon the number of involved muscles and the extent of the involvement, so that in the mild cases there is an inclination of the head toward one side and a slight rotation toward the opposite side, while, when severe, the deformity is exaggerated and the head is held immobile. Modifications of these are observed as other muscles are affected, and if the trapezius is much affected, there is less rotation, but more inclination to the side and backward and the shoulder is raised.

With an affection of both sides the head is drawn forcibly backward, and without rotation to the side, and it is held rigidly in that position. When the case is recent there are usually localized pain and tenderness, and passive motion will overcome the contracture in part at least. The condition may be congenital, and as such the cause is a subject of much dispute. It is not necessary to go into this discussion here, for until we have further definite knowledge, we must consider such cases as we do other malformations.

Of the acute acquired forms, the most frequent cause is an irritation of the spinal accessory nerve from an enlarged cervical gland. During the acute infectious diseases these glands are commonly enlarged, and this is the explanation of the occurrence of torticollis during the course of these diseases.

An exposure to direct draft may result in temporary stiffness. Sometimes torticollis is associated with acute or with phlegmonous tonsillitis and with retropharyngeal lymphadenitis, but it is far from being a common occurrence in the course of these affections. The pain is out of proportion to the amount of contracture when rheumatism is the cause, as it is very frequently in childhood. Torticollis of an acute form is sometimes observed

as one of the many manifestations of hysteria, but it is not common, and the other evidences of hysteria are so pronounced as to allow of no error as to the cause.

Chronic Forms of Contracture.—When one encounters a chronic and persistent contracture of the neck musculature in children, the cause is almost invariably found to be spondylitis. It is rare that the contracture is of the severe form, being in most instances that in which the head is simply extended, but with no retraction. In many instances the posterior muscles are the ones which are the first affected, but when the lateral muscles become involved, then the head is drawn to one side and we have a chronic torticollis.

It is not unusual (in fact, when watched for, it is found to be common) for a chronic state of contracture of the neck muscles to exist for several weeks as the first and only prominent sign of cervical spondylitis. Sometimes the other symptom are so indefinite that they are practically valueless in diagnosis, so that if one observes a chronic contracture which has no discoverable cause, then one is justified in making the diagnosis of cervical spondylitis, even in the absence of other symptoms.

One must always be guarded, however, against mistaking a form of contracture which is at first apparently chronic, but which upon investigation shows a distinctly periodic character, and which is due to malarial infection. The periodicity of such a condition and its disappearance under the appropriate treatment would clear up the diagnosis.

The influence which severe burns have in simulating torticollis or rigidity of the neck musculature need only be mentioned, as the mistake of the true condition (of skin contracture) is only possible by the most superficial examination.

WHY OUR OBSTETRICIANS SHOULD EITHER EXTEND THEIR LINE OF ENDEAVORS OR CONFER EARLIER WITH THE PEDOTROPHIST.*

WITH APOLOGIES FOR THE COINAGE OF A NEW WORD.

BY

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THERE is a very extensive awakening on the part of the medical profession, as well as on the part of the laity, seeking to ascertain and correct the conditions leading up to the very high mortality among infants. The fact that about 20 per cent. of all children born die before they are one year old, need but be mentioned to show how commendable are these endeavors.

The great majority of these deaths are among the very poor. Still, all classes show what would seem to be a needlessly high mortality rate.

Commendable endeavors are being made on all sides for the care and restoration to health of *sick* infants and children; but apparently, only meager thought, and this from the medical profession, is being given to conserving the health and strength of infants from the time they come into the world. A little discreet advice about the baby at birth, with a little "follow-up" supervision afterward, is better than a great deal of endeavor after the baby has needlessly been allowed to develop nutritional disturbances.

This stricture made against our profession can be excused in a measure because at present we have no name or recognition of a specialty in work among children which applies to what might be called "prophylactic work," or simply "care of children." *Pediatrics* is defined as relating to the *diseases* of children, and their *cure*. The great majority of babies are free from *disease* at birth. With the above thought in mind, not being a Greek scholar, the writer presented the facts to the occupant of the Chair of Greek at Columbia. He submits the new, and as he says, appropriate word, pedotrophy (care of children).

In our work among children, our greatest possibilities, not only as to saving life, but as to building up the best adult, lie along

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protective and preventative lines. This specialty is a broad and very comprehensive one, and the time is ripe for our schools and specialists to extend their usefulness by recognizing the *prophylactic specialty of childhood work*, pedotrophy.

The 20 per cent. mortality in infants under one year includes those born in institutions and those attended by midwives and private physicians.

Of all births recorded in Greater New York, 43 per cent. are attended by midwives. There are no statistics as to the mortality in infants born under these circumstances, but the death-rate is unquestionably very high.

Gastrointestinal diseases kill from 60 to 75 per cent. of the infants that die during the hot weather, and from one-third to one-half of each year's victims die before the third month of existence.

In the Borough of Manhattan, for August, 1909, of the 1,081 deaths under one year of age, 731, 67.6 per cent., died of gastrointestinal or nutritional troubles; 325, nearly one-third of the whole number, died before the third month.

Again, taking the same month and year, during the first week of life, fifteen died from nutritional diseases, twenty-four died during the second week, twenty-seven during the third week, and 109 in the fourth week of age. The very large increase in mortality for the *fourth* week over the preceding weeks is characteristic of all months of the year. Let me emphasize by repetition that these early deaths are all ascribed to nutritional diseases.

What is the apparent, if not indisputable inference, from these figures? It would seem that there was some radical defect or neglect on the part of those who should early advise for the child's nutrition and care; that the mothers are left largely to their own initiative until the baby becomes sick. The babies are given a poor start. They are placed at a disadvantage from the beginning.

Now, as to the reason for the suggestion contained in the topic of this paper. The best obstetricians we have in this city—and they have no superiors the world over—admit without hesitation that they take little or no thought regarding the many details influencing infant nutrition and care. This advice is largely left to the nurse, and only too frequently, she fails to properly fill the breach, by not starting the baby right.

This failure of our obstetricians to consider the *baby* as well as

the mother is further emphasized by the fact that in most of our large lying-in institutions, *no part of the regular attending staff* is made up of practitioners who give special thought to infant feeding or questions pertaining to infants in general.

As to the nefarious practice of the midwives, the less said about it, the better, unless some of the evidence of their neglect be gathered and placed before those in authority as a reason for wiping out the practice entirely. Probably 75 per cent. of the needless infant mortality can be ascribed to the law that makes it possible for more or less ignorant women to care for women and their infant progeny at the most crucial period in the life of either.

What has been said regarding the attitude of the specialist in obstetrics toward the infant, applies almost equally well to the general practitioner; he thinks too little about conserving the infant from his *first days*, but begins his endeavors after more or less needless damage has resulted from following either general principles or the advice of those about the household.

After this narrative of apparent facts—it is to be hoped they will not be considered groundless accusations—what remedy is to be suggested?

What *has been* done can at least be repeated—possibly it can be improved upon. In institutional work, that of the Free Outdoor Maternity Clinic, conducted by Dr. I. L. Hill and Dr. Herman Schwarz, New York City, may well be considered a model. Those interested in that line of work and desiring to do commendable work, can well study their report for 1909.

Of 784 children born and under their charge from November, 1908, to November, 1909, thirty-eight died. There were 105 born under their care, which passed from their attention before the expiration of the year. Thirty-eight deaths from all causes, in 679 known patients, brings their mortality well under 6 per cent., a very marked contrast to the general mortality reported in the city. This work, it will be remembered, was among the very poor.

In private work, the writer is conversant with a record of 117 infants born between 1905 and 1909, where but two failed to live one year because of nutritional diseases—less than 2 per cent.

In all lying-in institutions there should be the pedotrophist attending, who should assume to advise from birth on all questions concerning the baby. When the condition of the mother is favorable, in a series of talks she should be taught the fundamentals of the care of her baby. Of course, during the time

the mother is in the institution, the nurse should emphasize in a practical way all the principles advocated by the physician; with the result, when the mother and child leave for the home, there is a well-trained baby and a mother who has some definite idea of her responsibilities as a mother: a mother who knows what she is expected to do for her baby, and *how she is to do it*.

Moreover, the mother who has been taken into the confidence of the physician, and had certain definite principles explained to her, will have respect for advice that comes only from a physician, and will seek *his advice*, rather than that of every old woman who calls upon her.

Among the very poor, the "following-up" work and advice of a well-trained nurse can be invaluable, not only to the baby in question, but to the economics of the household. She can teach these poor women *how to live*, and in the absence of alcoholism, it is wonderful, what transitions are made.

In private practice, certainly no less advice should be given the mothers than those should receive who are cared for in institutions. If the surgeon does not care to properly instruct the mother, and protect the baby in every possible way, in the spirit of present day medical practice, he should have an associate who will.

Give the babies the greatest protection possible *from the beginning*, and this is only that to which they are justly entitled, then will we see a marked diminution in the mortality rate that pertains to the first year.

126 WEST EIGHTY-FIRST STREET.

VESICAL CALCULUS IN A BOY AGED FIVE YEARS.

BY

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(With illustrations.)

A. A., five years old, male, father and mother natives of the United States, was first seen on September 11. He is the youngest of five children, all of whom are living. The mother has always been strong and healthy. The father is not strong, but suffers from no disease. Otherwise the family history is negative.

Previous History.—The labor was normal and of short duration; the child was full term, and there was no asphyxia. He was nursed at the breast for nine months, then fed on milk, cereals and bread, until at the age of eighteen months he was eating a general diet. He has never had any of the diseases of childhood.

Present Illness.—The chief complaint is *pain on urination*.

The onset was gradual, beginning about three years ago, when the child was two years of age. This pain on urination has been gradually getting worse until now it is so severe that he dances about, pulls on the end of the penis, and cries during and after the act. There is more or less continual pain also, evidenced by restless sleep at night.

There is *increased frequency of urination* until now he urinates about every half hour by day and night.

Priapism is marked.

Hematuria has been noticed but once.

No sudden stoppage of the urine has been noticed.

The appetite is good, and the bowels are regular. The present diet is of the ordinary variety plus a good deal of tea. He drinks two or three cups of tea a day.

Physical Examination.—He is small for his age. His face is expressive of the suffering he has endured for so long. Except for a somewhat long foreskin, there are no noteworthy points about the general examination.



FIG. 1.



FIG. 2.

Bladder Examination.—Through a soft rubber catheter, No. 9 F., the bladder was irrigated with 2 per cent. boric acid solution, and a small amount left in. No. 5 F. sound was then passed, and after a little manipulation, distinct grating was felt, making the diagnosis of stone certain.

Urine Examination.—The color was amber; it was turbid, and there was a thick white cloud. The specific gravity was 1012. The reaction was neutral. There was a moderate amount of albumin. No sugar. Urea (not from a twenty-four specimen) was 16 grams to the liter. The microscope showed many pus cells, triple phosphates, and oxylate of lime crystals.

As the solvent treatment with lithia salts and piperazin has given no results except in small uric acid calculi, operation was advised and immediately accepted. Meanwhile, preliminary to operation, urotropin gr. iii four times a day was given, and the bowels moved freely with calomel and a saline.

On September 13, under ether anesthesia, assisted by Dr. F. B. Van Wart, a suprapubic lithotomy was done. In discussing the choice of operation I would merely say that lithotripsy is confined to cases where the stone is small and the bladder walls are healthy. In this case the small size of the urethra is also a contraindication to lithotripsy.

Operation.—Bladder irrigated with borosalicylic solution of Thiersch, and all the bladder would hold, 2 ounces, was left in, and prevented from escaping by tying a tape around the penis.

Vertical incision, $1\frac{1}{2}$ inches long, median line, lower angle below upper surface of symphysis, through to prevesical space of Retzius. Fat separated by blunt dissection until bladder wall was reached. It was seen that traction sutures could not be applied to bladder wall, as it was situated too deeply in the wound. The distention, which was all that was possible, owing to contraction of the bladder, was not enough. So a No. 9 F. sound was passed, and by depressing the handle the tip of the sound brought the bladder wall up so traction sutures could be applied. These were steadied, and the bladder opened between them by stab movement with sharp pointed bistoury, so as to penetrate the mucous membrane. Wound in bladder enlarged, stone forceps inserted, stone caught after a little exploration, and delivered through wound with a little difficulty. Finger inserted into the bladder, but no more stones palpated. On account of cystitis, drainage tube was inserted through suprapubic wound, held in place by sutures through bladder wall and edges of wound. Bladder wall and wound sutured above drainage tube. Bladder irrigated through drainage tube with Thiersch solution, and the wound dressed.

After-treatment.—Milk diet; morphine sulphate, $\frac{1}{32}$ grain every two hours for pain, and urotropin gr. iii four times a day. Urine withdrawn through drainage tube every two hours.

First day after operation, September 14: Temperature 100.4; urine, amount one pint, blood stained. Irrigation through drainage tube daily with Thiersch solution.

Third day, September 16: Comfortable; slight attack of diarrhea. Temperature 99.4; examination of urine: color is reddish, with a heavy white sediment. Specific gravity, 1020. Reaction alkaline; albumin marked. Sugar, none; microscope showed many red and white blood cells. Amorphous phosphates abundant.

Fourth day, September 17: Drainage tube removed, boiled and reinserted.

Fifth day, September 18: Tube removed; bladder irrigated through suprapubic wound, with Thiersch. Bronchitis developed. Temperature 100.4, for which ammonium chloride, one grain every hour was given. Dressing changed every half hour.

Sixth day, September 19: Bladder irrigated with Thiersch solution through urethra, and out suprapubic wound. Temperature 100.4. Bronchitis better.

Seventh day, September 20: Bladder irrigated as previously. Bronchitis better, but diarrhea. Temperature 99.4.

Eighth day, September 21: Passed some urine through penis two or three times to-day. Wound granulating and healthy. Skin sutures removed. On passing catheter some urine escaped. Irrigation showed that 2 ounces of Thiersch was retained in bladder with none escaping through suprapubic wound, showing that wound was closing down. From this time on there was no escape of urine nor fluid from irrigation through suprapubic wound.

Ninth day, September 22: Urine examination: Color, lemon yellow, turbid, heavy white precipitate. Reaction, alkaline. Specific gravity, 1016. Albumin marked. Microscope showed many pus cells and amorphous phosphates.

Eighteenth day, October 1: Wound has granulated up and is covered by small scab. Patient is up and around, comfortable and happy. Urine examination shows there is still a slight amount of cystitis. Urotropin which has been administered continually is continued in gr. iii, three times a day.

Twenty-sixth day, October 9: Cystitis has cleared up, urine is clear and shows nothing abnormal under the microscope except a few amorphous deposits.

Description of Calculus.—Size, $1\frac{3}{8}$ inches \times $1\frac{1}{8}$ inches \times $\frac{3}{4}$ inch. Weight, $\frac{3}{4}$ ounce. Shape, ovoid, flattened. Color, dark brown on outside, reddish and whitish gray where broken. It is hard. Surface is fairly smooth in places and slightly warty in others. In places it slightly resembles the mulberry calculus. Although no chemical tests have been made, I am inclined to think it is a mixed stone, uric acid, urate of ammonium, and oxalate of lime, going to make it up.

The extraordinary size of the calculus and the tender age of the patient make the case of more than usual interest.

159 HERKIMER STREET.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of December 14, 1911.

WILLIAM SHANNON, M. D., *in the Chair.*

CASE OF CHONDRODYSTROPHY.

DR. GEORGE DOW SCOTT presented this patient, a female child of about nineteen months. No history of syphilis or drunkenness in the parents or grandparents was obtainable. The child was born normally without instruments. The patient showed the

marked characteristics of the disease; the large overhanging head, the small tipped nose, the shortened long bones, the late dentition, the still open fontanelle, the cuffed skin of the legs, rachitis, the feeble musculature, the inability to stand, and the marked kyphosis of the lower spine. An enlarged thymus gland was present. This case had been confounded with syphilitic rachitis, hydrocephalus and cretinism. Dr. Scott presented pictures of the bones on the electric screen; they showed well the relationship of the epiphyses to the diaphyses. The thymus gland was also seen.

CASE OF CHONDRODYSTROPHY.

DR. L. E. LA FÉTRA presented a baby four weeks old showing a marked degree of deformity and dystrophy. The *x*-ray plates showed the characteristic shortening of the arms and legs and a peculiar bending of the tibias. For purposes of contrast, *x*-ray pictures were shown of a normal baby three weeks old. The difference in the length of the bones was very marked; there was especially noted a shortening of the humerus, the tibia and the femur; and the medullary cavity in all the long bones was seen to be much wider than normal.

A peculiar feature in Dr. La Fétra's case was the presence of very marked exophthalmus in both eyes.

DISCUSSION.

DR. CHARLES HERRMAN said that the two cases presented by Dr. Scott and Dr. La Fétra were very interesting. The two together gave a complete picture of this condition. Dr. La Fétra's case showed a distinct exophthalmus, a rare complication in this disease. The radiograph of the lower extremities showed not only the curvature of the shaft and the enlargement of the epiphyses, but a distinct change in the articulation at the knee. Dr. Scott suggested that in his case the thymus was slightly enlarged. This seemed peculiar in view of the fact that several authorities had advised the use of the extract of the thymus gland in these cases. Two were at present under such treatment at the Vanderbilt clinic. Some years ago Dr. Herrman had tried the extract of the pituitary gland, but without marked effect. However, he thought that its use was less empirical than the use of the thymus extract.

DR. WALTER LESTER CARR said these patients certainly were not normal, although they might be quick and alert, but they did not conform to the normal child. Some of them seemed elf-like and were precocious, but their mental development was uneven. Sexually, they were overdeveloped.

DR. WARD. B. HOAG said that the question had been raised regarding the differential diagnosis of cretinism from chondrodystrophy; while there were many *physical* points of resemblance

in the two conditions, the marked difference in mentality should make a differential diagnosis fairly easy. In the positive cretin there practically was an absence of mentality, whereas in chondrodystrophy the mentality is not affected to any *marked* degree, though they may be *somewhat* slow or backward.

DR. GEORGE DOW SCOTT asked if these children's minds were really normal. He believed that they were undeveloped mentally. He cited the court jesters as persons who were funny simply because they were abnormal mentally.

ABDOMINAL CYSTIC TUMOR IN A GIRL TEN YEARS OF AGE.

DR. SARA WELT-KAKELS reported the case of Rose K, who was brought to the children's department of the Mount Sinai Dispensary in the latter part of October, 1911, with the following history: Both parents and a younger sister were well, although the latter suffered occasionally with pain in the abdomen and was obstinately constipated. The patient was born a few days prematurely and the labor had been rather tedious, but spontaneous. She was breast-fed to the eighth month and her first tooth appeared when she was four months old. She began to walk in her fifteenth month and during her fifth year had measles and whooping-cough; she had frequently suffered from bronchitis and coughed a great deal. Two years ago she was kept home from school for four months on account of a persistent cough; she improved during that time and gained eight pounds in weight. Some eighteen months ago the mother noticed that the child's abdomen became larger; she occasionally complained of slight pain in the right iliac region. She was frequently nauseated after eating, but rarely vomited. She had obstinate constipation and frequent micturition.

Her present condition was that of a fairly well-nourished pale-looking girl. She weighed 68 $1/2$ pounds. The skin and the visible mucosa were normal; there were no Hutchinson's teeth; the tonsils were hypertrophied, and organs of thorax appeared to be normal. Upon inspection there was found considerable enlargement of the lower abdomen, but no venous distention and the umbilicus was not protruding. The greatest circumference of the abdomen was 27 $3/4$ inches; the distance from the umbilicus to the symphysis was eight inches. On palpation a large smooth tumor was felt; it was cystic and rather tense and pressed against the anterior abdominal wall, extending from above the symphysis to about 1 $1/2$ inches above the umbilicus, fluctuation being readily obtained. There was very little pain on pressure. On percussion there was dullness all over the surface of the tumor, the area of dullness remaining unchanged as the patient turned from side to side. The tumor was very little movable and occupied very nearly the entire front of the abdominal cavity and did not seem to be connected with any of the abdominal viscera; this also appeared from a digital examination per rectum.

Evacuation of the bladder by catheter did not seem to change the contour of the tumor. Inflation of the colon showed it situated at one side of the tumor. Examination of blood, urine and stool of the patient did not show anything abnormal. The von Pirquet test was slightly positive.

They had concluded that this was most likely an ovarian cyst. For differential diagnosis cystic tumors of the kidneys, liver, omentum and mesentery, as well as parasitic cysts, had to be considered and also cysts having their origin in remnants of the ductus omphaloentericus and such originating in the retroperitoneal space from remnants of Müller's and Wolffian ducts.

HIRSCHSPRUNG'S DISEASE IN BOY OF SEVEN YEARS.

DR. SARA WELT-KAKELS.—The father and mother of the boy were healthy and there was no history of alcoholism or lues. The mother had had four children and one miscarriage; the two older children were well, but the third died when eight days old. According to the mother his abdomen was large and he never had a natural movement of the bowels. He passed water only on the fourth day after birth and vomited meconium. This patient was born at full term and was breast-fed for fifteen months. The first tooth appeared when he was five months old and he started to walk when thirteen months of age. He was constipated from the time of his birth, the first movement occurring on the third day after birth, glycerine enemata and laxatives having been administered. A few days after birth the abdomen appeared to be enlarged and distended. The bowels moved only once in two or three days and the movements were small. During his second year his condition grew rather worse; he remained constipated for thirteen days. The sphincter of the anus was stretched and a tube inserted, through which large masses of feces were evacuated; he was somewhat improved for the following two months, when he became worse. His bowels only moved once in three or four days and occasionally when they would not move for a longer time he would vomit and complain of pain in the abdomen. In his fourth year he had diphtheria and was twice injected with antitoxin. He became weaker subsequently, not walking much, but preferring to lie down; he slept much. At that time, June, 1907, he first came under the attention of Dr. Kakels. His weight was 29 1/2 pounds; his abdomen was distended; the circumference around the umbilicus measured 23 1/2 inches. The distance from the xiphoid process to the umbilicus was 8 1/2 inches. The examination with the protoscope did not reveal anything very abnormal; the speculum could be introduced easily. In making a digital examination the finger above the ampulla fell into a large cavity. The urine showed a great deal of indican and skatol. The boy was put on a strict diet, daily irrigations and an occasional laxative. The abdomen became smaller and his general condition improved. He remained under her care for about six

months and then she did not see him again until November, 1911. In the interval the same treatment was carried out and the condition of the boy remained fairly satisfactory. During his sixth year he had scarlatina and, about a year later, measles. During the last few months the abdomen had become considerably enlarged and the constipation very obstinate. Occasionally he had pain and relieved himself by assuming the ventral position; he seemed better able to expel gas in this position. If he remained constipated for a longer time than usual he vomited, at first what he had eaten and then a dark greenish fluid. His hands and feet were always cold.

Examination showed an emaciated boy, weighing 44 $3/4$ pounds whose superficial lymph nodes, axillary and inguinal glands on both sides were enlarged. The thorax was short and in its lower portion considerably broadened. Its organs were normal. The abdomen was very much enlarged, especially in the upper portion between the ensiform process of the sternum and the umbilicus. The abdominal circumference measured 27 inches; the distance from the xiphoid process to the umbilicus being 7 $1/2$ inches and from the umbilicus to the symphysis 5 $1/2$ inches. The umbilicus did not protrude. The superficial veins were distended and movements of the intestines were visible through the abdominal walls. Percussion all over the abdomen showed tympanitis, but there was no tenderness on palpation, and no resistance could be felt anywhere. The liver and spleen were normal. Digital examination of the anus showed the tonus of the sphincter somewhat increased, but Foges' proctoscope could be introduced without any difficulty; it led into a large spacious cavity. At the upper end of it small hard fecal masses could be seen.

The tympanitic distention of the abdomen, visible peristaltic action of the intestine, obstinate constipation, occasional vomiting with abdominal pain and the fact that the symptoms of the trouble had been apparent from birth assured the diagnosis. The shadowgraph that was taken in prone position showed an intestinal sac of enormous dimensions. Blood, urine and feces did not show anything abnormal, and the von Pirquet reaction was negative.

The etiology of this rare disease was not quite clear. Danziger had collected 110 cases in 1907 from the literature, including his own, an infant of three weeks. Hirschsprung had the merit of having called the attention of physicians to it by publication of his own two cases in 1886, but cases had been reported as early as 1829. Hirschsprung assumed that there was a congenital dilatation and hypertrophy of the colon, a partial gigantism. Others like Mya and Genersich believed that there was only a congenital dilatation of the gut and the hypertrophy was compensatory, caused by the stagnation of the contents in the dilated gut; others again believe that there was only an undue length with a multiplicity of flexures of the gut at birth, which led through

stagnation of the contents to dilatation and hypertrophy. Merfau maintained that a functional stenosis might result from an anomalous position of the sigmoid flexure in its relation either to the colon descendens or to rectum, which again might be responsible for the stagnation of the contents; in a smaller number of cases volvulus of the sigmoid flexure, anomalous valves, etc., were found forming a mechanical impediment; also spasm of the sphincter ani.

The prognosis was on the whole not favorable, although occasionally patients might reach an advanced age. Death occurs not so often from complete obstruction of the bowel as from colitis, ulcerations, and perforative peritonitis. Frequently the patients became cachectic as a result of the long duration of the malady and malnutrition or they might suffer from chronic intoxication through absorption.

The most urgent indication is the removal of the accumulated feces; in Concetti's case about ten kilos of feces were removed; high irrigations, permanent drainage, massage, and electricity applied to the abdominal walls together with proper dietetic measures were applicable to these cases.

The outlook for recovery was better when surgical treatment was resorted to. The establishment of an artificial anus had been proposed as well as resection of the large intestine, anastomosis and colopexy.

According to Danziger's statistics of thirty-five cases operated upon, twenty-one, or 60 per cent., were cured, while of fifty-nine cases not operated upon, forty-four, or 74.6 per cent., died.

ACUTE GLANDULAR FEVER IN CHILDREN.

DR. SIDNEY V. HAAS said that despite the fact that more than a score of years had passed since E. Pfeiffer first read a paper describing this disease and although the picture had since been seen and recognized by numerous observers and many papers had been written on the subject, there was still discussion as to whether such a condition existed *sui generis*, or whether it represented a state of glandular enlargement secondary to infection of the nasopharynx and mouth, or perhaps an atypical or abortive form of some disease, having glandular swelling as an accompanying symptom. The observation of an epidemic and a review of the literature must convince one that such a disease did not exist as a clinical entity, although its etiology was still obscure. The chief argument of those opposed to considering the condition as a separate disease was that the glands involved drained the nose, nasopharynx, pharynx and mouth, and that through these the more distant group of glands became involved; and hence the symptom complex was only a manifestation of glandular enlargement due to a regional infection. Although this might be true the reaction of the glandular system to such an infection was so distinct and characteristic that there

was certainly as much justification for speaking of glandular fever as there was for speaking of scarlet fever, measles, or rotheln which were after all only the skin manifestations of mucous membrane infections and of the same area as that involved in glandular fever. The symptoms characterizing glandular fever and those which refused to fit into any other disease were fever and malaise, acute swelling and tenderness of the glands of the neck, accompanied by a lesser involvement of the entire glandular system. There was a rapid recession of the symptoms with sometimes repeated exacerbations of fever and enlargement of the glands a second time before complete recovery took place.

The disease occurred in sporadic and epidemic form, the latter seemingly the more common. Perhaps this was because single cases went unrecognized, or were classed as adenitis. Park West had described the largest epidemic, ninety-six cases among forty-six families extending over a period of three years. Many smaller epidemics had been reported. Kay Schaffer had reported the last from Kusten Hospital, in Refsnasm, Denmark. In four months twenty-one children ranging in age four to fifteen years of age were observed among the inmates of the institution. In New York city in the spring of 1911 there was an extensive epidemic. In Dr. Haas' private practice there occurred from February 20 to June 2, twelve cases in ten families. In the Out-patient Service of the Vanderbilt Clinic and the Lebanon Hospital many other cases were seen.

A study of the previous history of these cases developed the interesting fact that symptoms of the exudative diathesis existed in every instance as shown by charts. Perhaps this condition might prove to be a predisposing factor should further experience substantiate this observation. That the condition was contagious would appear from the fact that epidemics had been reported by Pfeiffer, Rauchfuss and others and from the fact that hospital epidemics might occur as reported by Schaffer, and when the disease entered a household where there were other children, one or more usually became affected. The disease was essentially one of early childhood, the overwhelming number occurring under the age of ten, and most of these under the age of five years. There seemed to be no predilection for either sex, and social condition did not seem to be a factor. Most of the cases occurred during the spring months.

The pathology of glandular fever was still obscure, though evidence seemed to point to the possibility of streptococcus infection at least as the cause of complications. It was not unlikely that more than one organism might be responsible for the condition. Cultures taken from the throats of patients having this condition showed as might have been expected streptococci, staphylococci, pneumococci and influenza bacilli. Cultures taken from the pus of cases in which the glands had broken down showed streptococci in pure culture in two cases which Schaffer reported, in two reported by Botchowsky and Korsakoff in an

autopsy on a case of glandular fever found streptococci in pure culture in the cervical, axillary glands, liver, spleen, kidneys and medulla of bones and heart blood. The glands showed acute parenchymatous hyperplasia with largely dilated blood-vessels. Morsakoff also took cultures from the urine in five cases complicated by nephritis and found streptococci in pure culture in three of them. According to Park West the incubation period of glandular fever was about seven days. The invasion was usually sudden, although slight fever and malaise might precede the outbreak by a day or two.

There was usually a variable degree of prostration, pain in the limbs, headache, considerable irritability, a moderately rapid pulse, and occasionally vomiting. There was usually pain in the throat and often in the abdomen as well. Physical examination usually showed a child somewhat flushed, irritable, restless, with slight coryza, slightly congested pharynx and a temperature of from 102 to 105, pulse from 100 to 140, and respiration in normal ratio to pulse and temperature. At the angle of the jaw a slightly enlarged gland and extremely tender to the touch would be found which even in this stage of the disease would cause the head to be held rigid in the position of torticollis. Pain was produced upon swallowing. The chest and circulatory system were usually negative. The majority of cases complained of pain in the abdomen in the median line midway between the symphysis pubis and the umbilicus according to the observation of Pfeiffer, but Dr. Hass believed this statement was incorrect; the pain might be anywhere below the umbilicus. Within from twelve to forty-eight hours in typical cases the gland at the angle was masked by a large mass, extremely tender, just beneath and posterior to the upper end of the sternomastoid muscle and varying in size from a pigeon's egg to a goose's egg. The glands along the anterior border of the sternomastoid muscle, the posterior cervical, the supraclavicular, the submental, submaxillary, and the parotids were enlarged as well as a fine net-work of glands about 1 cm. in diameter that covered the entire lateral and posterior aspects of the neck. Besides these the axillary, epitrochlear, inguinal, and mesenteric glands were frequently affected, becoming enlarged and tender. Park West found the mesenteric glands palpable in thirty-seven of his cases. That the retroesophageal and bronchial glands were also often enlarged scarcely admitted of doubt. The glandular swelling was bilateral although not always synchronous. In some cases the liver and spleen became palpable after a few days, but not regularly.

The disease followed one of two courses as a rule. Either the fever and prostration disappear in from one to three days and the glands gradually diminish in size, or after one or two days of moderate fever and malaise there is a sudden rise of temperature to 104 or 105; soon after the glands enlarge until they assume the size of goose eggs, or smaller, and after four or five days the attack subsides, the glands receding slowly sometimes taking

several weeks to become normal. It was possible to have the same group of glands swell and subside several times. These exacerbations might continue for several weeks.

The prognosis is good although fatal cases have been reported, and recovery was complete though it might be a long time before the glands returned to the normal size.

In cases which were not typical the differential diagnosis might offer some difficulties, but the entire absence of other physical signs and the quick changes in the size and number of glands involved, the unusual localization and extreme tenderness and the absence of blood changes characteristic of diseases having unusual glandular enlargement for a symptom should make the diagnosis.

Differential diagnosis had to be made from adenitis, having a distinct local process as its cause, from tuberculous and syphilitic adenitis, from Hodgkin's disease, from leukemia, from parotiditis and from calculi in the salivary ducts. When the condition became intermittent and prolonged it had to be differentiated from pyelitis and malaria. When the abdominal pain and tenderness was marked it had to be differentiated from appendicitis or other intraabdominal disturbances. In a small number of cases a nephritis arose which cleared up after the disease had run its course. A systolic mitral murmur arose in some cases which appeared to be hemic in character and regularly disappeared after recovery. Suppuration of the glands had been recorded though it occurred but rarely. The failure to recognize this condition might lead to false and grave prognosis and hence the disease was entitled to a place in all text-books on pediatrics which at present fail to mention it, and a fuller consideration in those which did.

DISCUSSION.

DR. CHARLES HERRMAN said that so long as the specific organism causing glandular fever, was unknown we should be groping more or less in the dark. Streptococci were frequently present but were probably secondary invaders. With regard to the portal of entry, one would naturally suppose it to be the nasopharynx. However, this was by no means certain. The point of attack is frequently at some distance from the point of entrance of the infectious material. Acute poliomyelitis is a striking example. It now seemed probable that the virus gained entrance through the nasopharynx, but the lesions were far distant in the spinal cord. It seemed likely that the virus of acute glandular fever had a special affinity for the cervical lymph nodes affected, just as the virus of mumps has for the parotid gland. We have numerous examples of such selective action. Dr. Herrman did not think that there was a very close relation between glandular fever and mumps. The incubation period was much longer in the latter and the age incidence was different. Glandular

fever was not uncommon in infancy whereas mumps practically never occurs in children under one year of age. The cases reported emphasized again the close relation between the exudative and the lymphatic diatheses.

DIAGNOSIS AND TREATMENT OF VOMITING IN INFANTS BY MEANS OF
A SIMPLE DUODENAL CATHETER.

DR. ALRED FABIAN HESS read this paper and gave the following summary: In infants it is possible without difficulty to insert a soft rubber catheter (Néleton No. 15 F.) past the pyloric sphincter and into the duodenum. The catheter is introduced in the same way as an ordinary stomach-tube; after some experience is acquired, the technic employed becomes almost as simple. In principle the catheter differs from the duodenal tube previously described by the author, mainly in that this instrument does not depend upon gravity or peristalsis to direct it to the pylorus. The mere force of inserting it propels it along the natural path of the food to the pyloric opening. This fact not only enables it to be introduced readily and surely, but gives it the additional advantage of a probe, a pyloric probe with which we may test the tonicity and irritability of this sphincter. Radiographs show that the catheter invariably, upon entering the stomach, bends sharply to the left to reach the fundus, and that therefore the more vertical position of the stomach of the infant, does not account for the ease with which the duodenum is entered. It is probable that unknowingly others have entered the intestine by this method, and in many instances reports as to the contents or the capacity of the stomach in infancy have been subjected to this source of error. By means of the catheter we can readily diagnose pylorospasm, and differentiate it from vomiting from other causes. In the case of spasm we meet with a persistent resistance encountered at the same point whenever we attempt to advance the catheter; this is frequently accompanied by sensitiveness of the pylorus. The spasm may be felt to relax suddenly, and to enable us to enter the intestine. Marked pyloric stenosis can be diagnosed from the failure to pass the pylorus after repeated attempts. A mild degree of stenosis, so slight as to allow of the passage of the catheter, cannot be differentiated from simple spasm. Cardiospasm frequently accompanies pylorospasm. This sign has been frequently overlooked due to the too forcible insertion of the stomach-tube. If a soft rubber tube, such as was originally used, is introduced into the esophagus, it may be found impossible to enter the stomach. Frequently as the result of this spasm the food does not enter the stomach, being checked at the cardia. Just as a marked gastric secretion frequently accompanies pylorospasm, so also does an increased duodenal secretion (duodenal succorhea). This secretion is found to contain protease, lipase, and amylase to a marked degree, so that in this connection we may speak of a pan-

creatic hypersecretion or succorhea. There are cases of cardio-spasm and pylorospasm unaccompanied by increased gastric secretion. In a case of this kind there was likewise no pancreatic hypersecretion. The catheter is of value in the therapy of pylorospasm. Its passage through the pylorus seems to relax the ring and in this was diminish the vomiting. It would seem of advantage to test the method of dilating the pylorus, and to pass the catheter frequently in such cases.

Another form of therapy consists of duodenal feeding. Radiographs show that this is feasible. It should be reserved for such cases as do not retain food given by gavage, and the food should be given slowly and in not too large amounts. In cases of this kind it has been found of great value.

DR. W. B. HOAG read a paper on

WHY OUR OBSTETRICIANS SHOULD EXTEND THEIR LINE OF ENDEAVOR OR CONFER EARLIER WITH THE PEDOTROPHIST.*

DISCUSSION.

DR. GEORGE L. BRODHEAD said that the paper was a very valuable one which demanded much attention and consideration, but he thought that Dr. Hoag was inclined to be rather severe in his arraignment of the obstetrician and the general practitioner. Dr. Brodhead did not think that they as a class paid so little attention to the details which concerned the nutrition and the development of the children under their care. Many years ago the duty of the obstetrician toward the child was supposed to cease when he had tied the umbilical cord and handed the baby over to the monthly nurse, but that day had long since gone by. The baby should by all means be given due consideration. Personally he felt that a mother who had gone through nine months perhaps of stormy pregnancy did so because she was very desirous of having a child which would be a strong healthy infant. It seemed to him that the child was deserving of at least as much attention and consideration as the mother.

Excellent results certainly had been shown in the Free Outdoor Maternity Clinic conducted by Dr. I. L. Hill and Dr. Herman Schwarz, a mortality well under 6 per cent. Dr. Brodhead did not know whether or not Dr. Hill and Dr. Schwarz had a dispensary. Every mother should be instructed to bring her baby to the dispensary connected with the institution in which she was confined. Connected with the Lying-in Hospital there was an excellent dispensary, the Vanderbilt Clinic was near the Sloane Maternity and the Post-graduate Hospital had a good children's clinic. At the latter institution Dr. Chapin, Dr. Caillé, Pisek and others were glad to give the mothers instruction as to the care of their new born babies. Every mother should be properly instructed how to care for her baby; the child did not come into the world of its own volition and the parents

* For original article see page 355.

should see that proper attention and care were given. The infant should have the best care from the mother and her physician from its very start in life. No obstetrician, gynecologist or general practitioner, should neglect the care of new born babies and they should see that the mother was properly instructed how to properly care for them. Every baby born in the lying-in service of any institution should be properly cared for while in the institution and the mother should be instructed, or urged if need be to bring her baby back to the institution at different times in order that proper supervision of the baby might be given. These babies should have every care, especially during the first year of life, and with the facilities and clinics here in the City of New York Dr. Brodhead did not see why they should not be properly treated.

DR. FLOYD M. CRANDALL said that the paper read was of great interest to him because it was in the line of preventative medicine. Certainly advances had been made in this direction. He compared the teachings of years ago with the teachings of today. At that time the new born infant received but little attention either from the pediatric or obstetric practitioner. It seemed to him that there were three classes of people who had charge of our babies from the first day of life. The first was the obstetric specialist; in this class there had been a great improvement during the last twenty years. They certainly used to pay but very little attention to the babies. The second class might improve very much; this class embraced the general practitioner who did much obstetric work and who paid but little attention to pediatrics or to the baby and it was a hard proposition to know just how to deal with him. They were the worst kind of baby-weaners and usually told the mothers to buy a certain baby food and to use it according to directions. The third was the midwives. Much could be accomplished by following up the babies when the birth report went in, such as was being done now, but the birth return often did not go in until one week or more after the birth of the child and by that time the damage was done. Much of the damage was done during the first week, and this week was one of greatest importance to the baby's welfare.

DR. GEORGE DOW SCOTT said that in his work in this line in New York City and in Boston he had been impressed with the fact that the mother's breasts were so often neglected. More attention should be paid to the breasts of the mother, as well as to her diet, and this would tend to make the milk better, give her less trouble in nursing her baby and lessen her desire to wean the baby from the natural milk.

DR. CHARLES HERRMAN thought that Dr. Brodhead was speaking, from the theoretical standpoint. It was not sufficient to simply open a milk station and tell the mother to come. There was always great trouble in getting them to return to the station regularly. On this account the visiting nurse was indispensable.

DR. WILLIAM SHANNON agreed with Dr. Brodhead in regard to the progress that obstetrics had made, and also what Dr. Scott had said in regard to the care of the mother's breasts before her baby was born. So far as the institutions were concerned, many of them were very negligent in the care of the baby and he believed that in many cases the obstetrician was at fault. He did not think that proper attention was always given the baby in some institutions. The nurse, as a rule, directed the feeding and under the guidance of directions laid down in the text-books written by good men but which often mislead the nurse and the mother. He thought that these books did much harm especially in the cases that were fed with difficulty.

DR. WARD B. HOAG, closing the discussion said he did not want to be considered as stricturing any *class* of men; especially such a man as Dr. Broadhead. That his remarks or suggestions were to be considered as one more effort to be added to the many already devised, and lower early infant mortality. Dr. Hoag said that many of the eminently prominent, obstetricians in this City had admitted that they took no particular thought about the many intricate problems connected with early infant nutrition, and that as the result of this, before many of the babies were placed in the care of a specialist, their existence was placed in jeopardy. He said that the very large mortality during the third week of life, was an evidence that there was some radical defect in the advice given regarding the care of the babies during the *first* week. Too many babies came from lying-in institutions on the bottle, and only too frequently the instructions given when leaving the institutions, as to the contents of the bottle, were such that it was very evident proper consideration was not given the subject.

In conclusion, Dr. Hoag thought if his suggestions could be made practical, both in institutional and private work, the results would prove commensurate to all concerned.

TRANSACTIONS OF THE CHICAGO PEDIATRIC SOCIETY.

Meeting of October 17, 1911.

The President, J. M. DODSON, M. D., in the Chair.

DR. F. W. SCHLUTZ, of Minneapolis, read a paper on

I. THE PYROGENIC ACTION OF LACTOSE

The question whether a food component if introduced into the intermediary metabolism unchanged is capable of developing pyrogenic action has received interest since Finkelstein published his observations on alimentary intoxication.

Newer investigations have caused Finkelstein to modify his earlier views in regard to the causes of the so-called alimentary fever. He now believes that in this condition the sugars seldom develop pyrogenic effect but confine their action to the production of intestinal lesions, possibly functional. These prevent the proper metabolism of the salts and permit them to develop their physical effect, expressed in the production of fever.

The experiments were carried out on rabbits and can conveniently be divided into three groups.

1. Intravenous injections. Twenty-three intravenous injections of lactose in concentration of 5 per cent. up to 50 per cent. and amounts varying from 6 c.c. to 50 c.c. gave nineteen positive reactions. The general average reaction was 0.36. The highest single rise 1.3° C.

In two other series lactose in concentration of 9 and 10 per cent. was combined with Physiological Salt Solution and Ringer's solution. A positive rise of temperature followed in every instance. The average reaction for lactose and physiological salt solution was 0.71° C., and for lactose and Ringer's solution 0.9° C.

2. Subcutaneous injections. Twelve injections of lactose solution in concentration of 9 to 10 and 20 per cent. and in amounts varying between 5 and 100 c.c. gave the lowest average rise of temperature of all experiments.

3. Administration per os. Rabbits apparently free from alimentary disturbance were given lactose alone in concentration of 5 to 50 per cent. and in amounts varying between 50 and 100 c.c. In nine experiments only four reactions were above the control—adding physiological salt solution or Ringer's solution to the lactose gave only slightly higher reactions than lactose alone.

Intestinal disturbance was then produced in the rabbits by feeding B. oxybutyric acid and croton oil. Lactose solution alone in concentration of 9 and 10 per cent. and in another series in combination with physiological salt solution and Ringer's solution was fed the rabbits at the onset of the diarrhea.

A positive reaction occurred in fourteen out of sixteen experiments. Individually the rises above the control temperature were higher than in any of the other experiments in five instances reaching or exceeding 1° C.

The results of the experiments warrant the conclusions that:

1. Lactose if given intravenously, subcutaneously or orally, possesses no distinct pyrogenic effect.

2. It does possess a definite though not pronounced influence on the temperature if it is given subcutaneously or orally in a diseased intestinal tract in combination with a medium containing a sodium salt such as physiological or Ringer's salt solution.

The results though definite are hardly to the extent which we would expect when we consider the pronounced effect produced clinically by the administration of lactose in similar conditions and

are far from explaining the pathogenesis of the fever occurring in alimentary intoxication.

DISCUSSION.

DR. H. F. HELMHOLTZ was very much interested in these results, especially as they are on the negative side of this question. Most of the results of lactose and salt solution injections have shown that they exert a decided pyrogenic action, and, as such, they were made use of by Finkelstein to explain the origin of alimentary fever. There has been considerable work done in the past two years, and it has been shown that this is not so simple a proposition as we believed it to be. The fact that the fever occurs after we administer salt or sugar is no reason that they by their absorption produce fever. As has been shown by Meyerhofer and Priabran, products may be absorbed from the intestinal tract as the result of conditions produced by sugar or salt.

A Russian was able to show that by giving large doses of calomiel and other cathartics he could induce a decided change in the bacteriology of the intestinal tract. Parts which were normally sterile would contain many bacteria. By means of high external temperature he produced such permeability of the intestinal wall that bacteria passed through readily and were found in both the liver and spleen.

DR. C. G. GRULEE.—I have been doing some work on this and it seems to me that one of the fallacies in the whole subject is that salts have been taken up singly and not as a whole. We must study the relationship of one salt to another. Whether sodium chloride when injected causes fever or not must depend on whether such action is antagonized by the presence of other salts in the organism. Everything depends on this relationship of one salt to another. To consider only the action of single salts will give us only a fragmentary idea.

We do not know what metabolic disturbances are caused by the injection of salt. They may differ in various cases because of the presence in excess in the organism of some other salt or salts. That has been brought to my mind strongly by some experiments I have been making.

DR. A. H. BEIFELD.—The results reported by Dr. Schlutz are of special interest because they indicate that the last word as to the relationship of the carbohydrates and alimentary intoxication has not as yet been spoken. The fact that the results are not all in accord is evidence that there must be certain conditions affecting the experiments, which have not been taken into consideration. It is my opinion that the rôle of the liver has not been sufficiently looked into. I believe that Finkelstein himself once suggested that we might expect some toxic action by the sugars (and the salts) directly on the liver itself.

DR. F. W. SCHLUTZ, of Minneapolis (Closing).—I was interested in Dr. Helmholtz' remarks in regard to the experiments made by

the Russian author. I believe that we cannot entirely disregard the action of bacteria. We must consider that when we make further studies on alimentary fever.

As to Dr. Grulee's remarks, I believe that these experiments have in a way borne out that we must pay attention to the correlation of the food components; that is, not as to giving lactose alone, but the medium it is given in and its relation to other components. That is one of the things which, if not properly heeded, will lead to poor results. Finkelstein lays great stress on this. These facts have an important bearing on the pyrogenic effect of food components.

Dr. Beifeld suggests the injection of substances directly into the portal vein. Rosenthal has made experiments along that line. He injected directly into the portal vein in a few instances. I believe he mainly used salt solutions. He cut out the liver metabolism in order to disprove a theory which Finkelstein had mentioned, that possibly the liver metabolism had effect on the production of fever. Finkelstein believed that the functions of the liver and kidneys could be altered to such an extent that they, through lack of function, could cause pyrogenic substances to appear in the circulation and thus give rise to fever. As far as I know it is the only instance mentioned in the literature, in which substances were introduced directly into the portal circulation.

Dr. J. C. Sedgwick, of Minneapolis, read a paper on

THE CREATININ AND CREATIN EXCRETION IN RECURRENT VOMITING.

THE older methods of determination of creatinin and creatin were very tedious and unsatisfactory. Folin's method, published in 1904, has been a great stimulus to the study of the metabolism of these substances. Folin's work showed that the creatinin excretion of an adult is remarkably constant, and he believes that the creatinin output is an indicator of endogenous nitrogen metabolism.

Fever increases the creatinin output according to Hoogenhuyze and van Verploegh.

Cathcart found that creatin is constantly present in the urine during starvation, and that carbohydrates given after fasting decrease the creatin output; whereas fat given after fasting increases the creatin excretion. He therefore puts forward the hypothesis that carbohydrates are absolutely essential for endocellular synthetic processes in connection with protein metabolism.

In 1910 Sedgwick discovered that creatin is excreted by the subjects of cyclic vomiting, the first case showing 1278 mg. of creatinin and 49.9 mg. creatin on the fourth day of an attack.

Mellanby has confirmed this finding and discovered a marked rise of creatin excretion two or three days before the attacks. He also found creatin to be constantly excreted between the

attacks. Several new analyses confirm my earlier findings, as well as those of Mellanby's. The following table of analyses is illustrative:

Edward S. had his first attack during the latter part of the first year. During the following year he had attacks at least every three weeks.

Date	Age		Creatinin	Creatin
March, 1909 ..	2 yrs. 10 mos..	Not vomiting. Weight 12,270 gm.	193.	
Sept. 6, 1911..	4 yrs. 4 mos..	Vomiting, fever.....	245.7	143.6
Sept. 7.....		Well.....	403.2	299.4
Sept. 23.....		Well.....	215.6	48.4
Sept. 27.....		Well.....	201.6	44.5
Sept. 30.....		Fever, 102° F., not vomiting....	213.3	154
Oct. 5.....	4 yrs 5 mos.....		321.3	135.9
Oct. 7.....			211.5	0.
Oct. 10.....			307.2	15.3
Oct. 16.....		Weight, 17,885 gm.....	322.2	

These results show, as do Mellanby's that the creatin metabolism, that is, the endogenous nitrogen metabolism, is abnormal in recurrent vomiting, between the attacks as well as during them.

Dr. Sedgwick, also read a paper on

(b) THE RELATION OF ADENOIDS TO RECURRENT VOMITING.

MANY more or less unsatisfactory theories have been advanced concerning the etiology of recurrent or periodical vomiting. The idea that acid intoxication is the etiological factor, is now being generally discredited. Postmortem examinations have given little information.

Comby considers appendicitis, which was present in nearly 50 per cent. of his cases, to be of importance. Others speak of membranous enteritis, neurosis, hysteria, arthritis, diminished oxidation and hypersecretion of irritating gastric juice as causative factors.

The liver is spoken of by some, and Hecker considers the condition of the disturbance of the fat metabolism. Averagnet, Breton, Griffith, Misch, Irving Snow, and Comby mention disturbances of the nasal pharynx in connection with these cases. Rachford says: "Recently I have been especially interested in vasomotor coryza as an almost constant warning symptom in a number of cases."

Janeway and Mosenthal state, referring to recurrent vomiting, that: "The strongest argument in favor of its being due to an undiscovered focus of infection is the leukocytosis."

Sedgwick's series of twenty-two cases, show adenoids in twenty. The posterior cervical glands were usually enlarged. A very common prodrome of the attacks was sore throat or nasal discharge. One "had bleeding nose at the times of the attacks."

Chorea minor, rheumatism and endocarditis were complications in three cases. Geographical tongue and asthma were noted. But the observation which warrants this presentation is the surprising result of removal of the adenoids in some of these cases.

CASE I.—Leland W., four years old, had classical, frequent, recurrent vomiting from the latter half of his first year. Tonsillitis was a usual prodrome of the attacks. The tonsils and adenoids were removed in February, 1911. The mother stated on September 21, 1911, that the child had been "perfectly well since."

CASE II.—Cecil W., ten years old, a brother of Case I, had typical attacks from his second year. The adenoids were removed when he was six years old. He had no more attacks for a year. He had two light attacks during the eighth year. Then he developed appendicitis, and has been perfectly well since his appendix was removed in February, 1911.

CASE III.—Stuart S., six and one-half years old, began to have recurrent vomiting attacks with high fever and rhinopharyngitis in his second year. The attacks occurred every month or six weeks. They were becoming more frequent. On February 25, 1909, his adenoids were removed. There have been no more attacks from that date to the present, October, 1911.

CASE IV.—Edward S., five and one-half years old, began to have recurrent vomiting attacks during his first year and had vomiting periods at least every three or four weeks until the adenoids were removed in the fall of 1908. For six months after the operation he was free from attacks, then he had occasional lighter attacks. During the past six months these have been more frequent but lighter. It is to be noted, however, that the nose trouble has recurred.

CASE V.—Thomas A., seven years old, very similar to that of Case IV.

CASE VI.—Bernice S., eleven years old, was first seen in 1906 with recurrent vomiting. Rhinopharyngitis always accompanied the attacks. The attacks did not cease at once after removal of the adenoids but became gradually lighter and less frequent. She has had no attacks for several years.

Such a large percent of cases with adenoids would indicate that these children are possibly exudative in Czerny's sense.

Whether the nasopharyngeal infection is the "undiscovered focus of infection" of which Janeway and Mosenthal speak, or whether Mellanby's suggestion concerning infection is considered correct, these results would seem to warrant either operative therapy or Czerny's dietetic regime in cases of recurrent vomiting which are ushered in, or accompanied by vasopharyngeal inflammation.

DISCUSSION.

DR. JULIUS HESS.—I would like to ask Dr. Sedgwick whether in his studies he made examinations as to the quantities of acetone

bodies in the urine, and whether there were any intestinal symptoms.

DR. S. J. WALKER.—The subject of cyclic vomiting is an interesting one because the etiology is seemingly so obscure. Authorities are at variance as to the cause. The attacks of vomiting are always so very similar that the mother soon learns to recognize the premonitory symptoms and is able to tell when the child is going to have an attack. She knows that the vomiting will be very intractable and that it will continue for several days and then suddenly cease; *i.e.*, coming on suddenly without apparent cause and disappearing suddenly. Several years ago I kept under observation a number of these cases and reported them. I came to the conclusion that the underlying cause of cyclic vomiting is not anenoids or eye strain or other peripheral irritation, but that it is probably central in origin; I also came to the conclusion, for which conclusion there is a very considerable basis, that cyclic vomiting is a manifestation of migraine. In the first place, we know that migraine is inherited in about 90 per cent. of the cases. There is a history of migraine in the father, the mother, or both father and mother in that exceedingly high percentage of cases. I have never seen a case of typical cyclic vomiting in which I did not get a history of migraine in the family. In addition, there are several very suggestive similarities between the two conditions, especially periodicity, abrupt onset and abrupt ending. And so it seems to me the etiology of the disease or symptom-complex can be ascribed largely to heredity, and that in all probability the underlying cause is central. It is possible of course and even probable, that the exciting cause of attacks may be eye strain, enlarged tonsils, adenoids, or some other peripheral irritation.

DR. F. W. SCHLUTZ, of Minneapolis.—I saw many of these patients of Dr. Sedgwick. They showed indubitable evidence of exudative diathesis. As this is probably as hereditary as migraine, it may explain many things. These patients did not complain of headache or migraine symptoms. As to the Thompson child, it has adenoids and spasmophilia. The child gives pronounced electrical reactions, is a neurotic, and gives many other symptoms which we get with exudative diathesis. The adenoids have not been removed; the appendix has been removed, and the child has had since then two definite attacks of recurrent vomiting. The child has been under treatment for the exudative diathesis condition for three months, without any very marked effect, except such as is shown in the creatinin excretion. It is interesting to know whether the carbohydrate diet will have some effect on this condition.

DR. MEYERS.—It is interesting to know of the frequency of adenoids and enlarged tonsils in these cases of periodical vomiting, but that does not help us to explain the cause of such vomiting when these conditions are not present. So far as my own experience goes, it seems to me that the cases in which there is no

demonstrable hypertrophy of the adenoid tissue, and nothing wrong with the tonsils, are very much in the majority. I should say that in at least three-fourths of the cases I have seen where the condition has persisted for some time, there was absolutely nothing that could be removed, no evidence of adenoids or diseased tonsils, and yet, even in these cases, a febrile disturbance of any kind will precipitate an attack of vomiting. The statement of Combe that the appendix is frequently involved is a difficult one to believe if one studies the cases that have been reported in this country. His experience seems to have been that nearly 50 per cent. of the cases are attributable to trouble in the region of the appendix; whereas in this country not more than 10 per cent. of the patients have local symptoms. In the cases I have seen thus far there has been a dietetic cause for the attack, and I cannot believe that the condition could be caused either by adenoids or tonsil disease.

I was interested in Dr. Walker's statement that he so frequently sees hereditary migraine in these cases. I cannot remember that any of the patients I have seen developed migraine as they grew older.

DR. C. G. GRULEE.—To my mind, exudative diathesis and migraine mean one and the same thing. If we take up arthritism, as the French see it, it includes exudative diathesis in the child and migraine in the adult, and for that reason I can see why there is a connection between the ideas of Dr. Walker and Dr. Sedgwick. The exudative diathesis produces in the infant a number of throat symptoms, and arthritism in the adult means a tendency to migraine, uric acid disturbances and diabetes. The condition on which the whole rests, I believe, is the same for both conditions.

DR. SEDGWICK (closing).—There have been no analyses made for acetone in these cases, because Mellanby's work seems to clinch the matter and further work is hardly worth while. Acetonuria can be brought on by withdrawing the carbohydrates. The creatinin and creatin also increase upon the withdrawal of the carbohydrates.

Some of these cases do have intestinal symptoms. Mucomembranous enteritis may occur. We have thrown out of consideration in our work such cases as these, because we did not want to confuse our results.

In regard to the inheritance of this condition: That is a point well taken, especially if it is in any way connected with the exudative diathesis. Adenoids are only a part of the picture.

It is probable that this series of cases has shown more than the usual proportion of adenoids and enlarged tonsils. Some authors believe that dietetic errors cause the attacks. There seems to be something fundamentally wrong, and many points indicate that it is part of a diathesis, either exudative or arthritic.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Vasoneurotic Symptom-complex in Children.—Franz Hamburger (*Münch. med. Woch.*, Oct., 1911) thinks that there is a type of child which from a congenital condition of vasomotor instability has various heart and vascular symptoms, which, although entirely functional, cause much anxiety both to parents and physicians, and seem to indicate organic heart disease. These are the so-called nervous children and are often the offspring of nervous parents. The symptoms indicate a feeble, unstable innervation of the vascular apparatus, and of the central nervous ganglia of the heart as well. The heart symptoms are palpitation, uncomfortable feelings over the cardiac region such as feeling of pressure, sticking pains, etc. These occur generally after exertion or mental disturbances. There may be a feeling of shortness of breath and a sort of modified angina pectoris may occur. There are slight epigastric pulsation and diffuse apex beat, without dilatation of the heart; the heart sounds are normal, the cardiac rhythm is regular. All these symptoms are well-known in the adult, but have been little observed among children. The epigastric pulsation is caused not by the ventricle, but by the descending aorta. In these cases the pulse frequency increases with respiration and decreases with expiration. One of the vascular symptoms is headache after mental disturbance or work. This headache is bilateral, either frontal or occipital. It is dependent on changes in the circulation of the brain. Suddenly occurring congestion of these vessels causes dizziness and faintness. These symptoms simulate anemia, while there is no abnormal condition of the blood, but one of the vasomotor system. There is a tendency to cold and clammy feet and hands, and easy frosting of these members. The hands look blue or red and the parents say "this child is always cold." Pain in the heart may be due to hyperemia of the heart muscle. There are many objective signs: blushing, dermatographia, beating of the carotids, increased arterial tonus at the radial and temporal arteries, lordotic albuminuria, and bronchial asthma. There is nervous instability of the entire circulatory apparatus. The contraction of the arterial walls may be such as to simulate arteriosclerosis. Normally in children under six years of age the arteries are rarely palpable, only a movement of the pulse being felt, and not the wall of the artery itself, while in these children at the time of contraction the arterial walls are palpable. There is great variability in the arterial tension. All children with

rigid arteries are found to be nervous. Cold feelings all over the body with shivering simulate chills, with a hot period following. These disturbances are purely vasomotor. Such children are often so pale and have such blue rings under the eyes that they are given iron under the belief that they are anemic. These nervous symptoms are found in boys as well as in girls. The causation seems to be a congenital weakness of the vasomotor control of the vessels. Alcohol, tobacco, and bacterial toxins produce similar symptoms, especially when occurring in such persons. Pallor in fear, and redness in anger with heart-beating are common. These children are very unstable in their dispositions and easily disturbed; psychical traumata affect the vessels and the heart as well. Children with good dispositions are over-sympathetic. The diagnosis of this condition is not difficult; the sudden headaches must be differentiated from headaches produced by refraction errors, catarrh from adenoids, ear diseases, and migraine; the dizziness from anemia and epilepsy. The prognosis is good if the cause of the disturbances is recognized and measures are taken to regulate the vascular apparatus. Hygienic measures—baths, fresh air, good feeding, and mental control—are the measures to be adopted in strengthening and regulating the vasomotor system. Such children should not be too much humored, and should be taught not to yield to their disagreeable feelings. Finally the author thinks that such a condition of the arteries predisposes to arteriosclerosis in later life.

Instruction of the Deaf Child with a View of Spreading Information Regarding this Matter.—The American Otological Society (*Trans. Amer. Otol. Soc.*, 1911, vol. xii, Part ii, 289) has included in the report of its committee on this subject a syllabus prepared by the American Laryngological, Rhinological and Otological Society for the assistance of lecturers in medical schools. The chief items in this syllabus are as follows: Deafness is the natural condition of early infancy. Hearing is an acquired faculty developed during the second, third or fourth months. Refinements of hearing are largely a matter of education. A positive diagnosis of deafness is exceedingly difficult, especially in the first, and sometimes even in the second and third years. Tests for hearing power are best made behind the child's back, in order to eliminate the faculty of seeing. Concealed bells and whistles of various degrees of loudness may be used. Muteness is oftentimes the first indication of deafness. Deaf mutism is congenital or acquired. Congenital deaf mutism occurs in those born with no potentiality for hearing. Acquired deaf mutism is the result of postnatal affections of the organs of hearing, arising from either peripheral or central inflammatory conditions which usually extend to the labyrinth. Deaf mutism acquired after the development of speech results in a class of so-called semi-mutes, or those who have some remnants of automatic speech remaining, although the hearing may be entirely lost. Neglected

deafness acquired as late as the sixth, seventh, or even eighth year may result in dumbness. Muteness is not pathognomonic of deafness, other possible causes being a faulty development of the psychomotor or kinesthetic areas of the brain, and certain forms of paralysis of the peripheral organs of speech due to a faulty development of their motor centers in the bulb and spinal cord. The character of the speech is an index to the character of the hearing, defective speech generally denoting defective hearing. Partial deafness may be suggested by the omission of certain sounds of speech. Mutism is not necessarily accompanied by absolute deafness. Slight deafness may result in mutism when the mentality is not of high grade. Physically, the deaf child differs from the normal child only in respect to the conditions which cause the deafness. The brain of the adult deaf mute, however, may be somewhat smaller than the average brain, and the respiratory organs may show some lack of development on account of their relative inactivity. The mental operations of deaf children who are taught to speak differ in no essential respects from those of hearing children. The natural sign language, or the acquired manual or finger language is not adequate to precision or rapidity of thought, and requires the use of different parts of the brain. Speech distinguishes man from the lower animals and is absolutely necessary to the highest psychical development. Lower animals have a language of their own, but they cannot speak. Deaf mutes who have not learned to speak are mentally of higher grade than the lower animals because of their inheritance and of their greater powers of expression. During the first year, or prior to the period of beginning speech development, congenital deaf mutes differ but little mentally from normal children. Deaf mutes who have learned to speak and to understand speech by the modern methods may be but little, if any, handicapped mentally by their deafness, because the only necessarily undeveloped cerebral area is that employed in audition, the visual area being specially trained to take its place. The pathology of deaf mutism is not well established on account of the difficulties in getting accurate clinical histories combined with adequate postmortem findings. Arrested development of the auditory centers of the brain is not easily distinguished. Evidences of pre-existing middle and inner ear diseases are frequently found. Heredity is an important etiological factor. The affection may skip one or more generations to appear in a later one. The intermarriage of deaf mutes, and even of hearing persons having a deaf mute ancestry should be discouraged. Labyrinthine disease, whether originating centrally or peripherally, is the most frequent direct cause of deaf mutism. Cerebrospinal meningitis, measles, scarlatina, and typhus fever are frequently followed by deafness. Inflammatory conditions of the middle ear, so common in infants and sometimes resulting in extensive destruction or ossification of the contents of the tympanic cavity, are also causes. Prevention of deaf mutism is

entirely possible in many instances. Inflammatory conditions of the middle ear at birth are the rule rather than the exception, and many children having acquired deafness during the first year are classed as congenital deaf mutes. The prevention of deaf mutism consists in a vigorous, scientific treatment of the early causes of deafness. Amelioration of the deafness, and even a cure of the deaf mutism, in the first two or three years are among the possibilities. It demands prompt attention to middle ear disease of all kinds, and all symptoms and diseases referable to the ear, and the development of increments and zones of hearing by the use of musical instruments, by tuning forks, and by the use of the speaking voice in close approximation to the ear. The education of the deaf mute should begin in early infancy with training of the special senses. The training and development of latent hearing power is especially useful in the production and modulation of the voice. The sense of touch is easily developed in childhood and quickly lost if not practised. Kinesthetic areas of the brain are of great importance to the deaf in the acquirement of satisfactory phonation and articulation. The training of the visual sense for lip or speech reading is also of great importance. It is desirable to encourage the babbling and prattling of deaf infants, and to talk to them as if they could hear. Early neglect and undue sympathy are the greatest obstacles to success. All this is practicable during early childhood and in a well conducted home. An intelligent mother or governess, with a little instruction from the physician or teacher, may save bright deaf children from the stigma of muteness. Many deaf children are found in ill-conducted homes, and hence, the desirability of special institutions for their early education. There are differences of opinion as to whether the deaf who have learned to speak should be educated together with or apart from their hearing fellows. Exceptionally bright children may progress satisfactorily in schools for the hearing, but it is impossible for any but the exceptionally bright to accomplish this task. The teaching of phono-articulation and lip or speech reading to the deaf is a difficult procedure and requires enthusiasm, patience, knowledge, and skill. Success in the work is dependent largely upon the teacher's ability to arouse interest on the part of the patient.

Little's Disease.—V. Hutinel and L. Babonneix (*Ann. de méd. et chir. inf.*, Oct. 15, 1911) defines Little's disease as a muscular rigidity of a para- or quadruplegic type, with slight intellectual disturbances, and athetosochoreic movements. It is frequent among the new-born, especially when premature, immediately after birth. It is never complicated by sensory, sensorial, or sphincteric symptoms, and tends gradually to regress spontaneously. It is essentially chronic and not dangerous to life. The author divided the etiological factors thus: first, causes acting before conception, of toxic nature—alcoholism, and saturnism; of infectious nature—syphilis, tuberculosis; second, causes acting at the time of conception—acute

alcoholism; third, causes acting during pregnancy—infections, intoxications, emotions, abdominal traumatisms; fourth, causes acting at the time of labor—premature labor—difficult labor, asphyxia; fifth, causes acting during the first months of life—toxi-infections and digestive troubles, acute or chronic. Syphilis has undoubtedly an influence in causing this disease. Maternal alcoholism is especially important as an etiological factor. Emotions have little influence. Prematurity alone has little likelihood of causing this condition, but may combine with other causes in its production. Fetal infections are important, both as predisposing and determining factors. Obstetrical operations and difficulties alone will not be sufficiently causative, but in combination with prematurity and infections are capable of causing Little's disease. Thus we see that the principal causes are mechanical and infectious; maternofetal toxi-infections, especially syphilis; premature and complicated labor. Each may act alone, but several factors are generally believed to be combined. The pathogenesis is simple. When obstetrical difficulties are active they act by means of the nervous system, in producing traumatism, blood stasis, and hemorrhagic foci. When gravidic toxi-infections act alone they cause nervous lesions, hemorrhage, and cellular degeneration. When both causes are associated circulatory disturbances result from nervous lesions. Thus in each case nervous lesions are the basis of the disease. There are always cerebral alterations and medullary changes. The cortical changes are about the upper Rolandic area and the fibers which emanate from it; the medullary, in the pyramidal tract, consist of slight or marked general sclerosis, with the characteristics of secondary lesions. These changes differ only in location from those that cause the other varieties of cerebral diplegias. The physiological pathology of congenital rigidity is unknown; in the majority of cases the principal symptoms—contracture, intellectual troubles, and convulsions are of cerebral origin.

Clinical Value of the Cutaneous Tuberculin Reaction in Children.

—E. Merioz and B. Kaalatoft (*Rev. méd. de la Suisse Romande*, Oct. 20, 1911) state that the Calmette conjunctival reaction is not absolutely innocuous, and should never be used in any eye that is subject to inflammation, especially if tuberculous. Therefore the skin reaction is much to be preferred to the conjunctival. The authors tested 337 cases among children, and tabulate their results. They conclude that the cutaneous reaction is the only one that is justified, and is the most simple and practical procedure in children for the diagnosis of tuberculosis. Its value is undoubted, and is greater according as the child is younger. A positive reaction in a nursling is extremely rare and should be considered clinically of great importance. The nearer the child approaches adult life the greater is the number of positive reactions. It may be negative some days before death, in the cachectic, in pneumonia, in tuberculous meningitis, in miliary

tuberculosis, and in measles. In all negative cases a second test should be made. Out of the 337 cases tested at Geneva 175 were positive, that is, 51.9 per cent. Out of 189 infants with clinical signs of tuberculosis, 143 reacted positively. Out of 178 infants clinically nontuberculous, twenty-nine were positive, that is, 10.6 per cent. Lastly thirty-five cases came to autopsy. The cutaneous reaction was negative in fifteen, which showed no tuberculous lesions; it was positive in eighteen with tuberculous lesions, and negative once with tuberculous pneumonia, and in one case of tuberculous meningitis.

Clinical Utilization of the Reaction to Tuberculin in Children.—M. Péhu (*Lyon méd.*, Nov. 5, 1911) places the reaction of Mantoux first in order of sensitiveness as a test for the presence of tuberculosis. Next comes the von Pirquet cutaneous reaction, and last the Calmette conjunctival reaction. As to practical application of these tests the skin and conjunctival tests are easier of application and quicker. The subcutaneous is more complicated, and necessitates repeated taking of temperature, and careful watching. It can only be used in absolutely apyretic cases. The skin reaction gives no trouble, but the conjunctival reaction may present grave difficulties, and should never be used where there is any conjunctival irritation. The skin reaction is the most practical, simplest, and is sufficiently delicate for all practical purposes. But all these methods give only a general reaction; they do not point out the seat of the lesion, its anatomical variety, or the method of its evolution. They simply show that at some time the patient has had tuberculosis. They do not even show that the tubercle bacillus is the only cause of the symptoms. For the nursing the results are absolutely sufficient; at this age tuberculosis is found latent and progressing along with other disturbances, advancing slowly. Later in childhood latent, inactive tuberculosis is rare. If here we get a positive reaction the tuberculosis is the real substratum of all the troubles of the child.

Physiotherapy and Secretion of Milk.—F. Lobligeois (*Le Progrès méd.*, Oct. 28, 1911) reviews the different physical methods of increasing the supply of breast milk when that is deficient. He finds that the most effective method is that of suction either by the child, by a breast pump, or by the Bier method. Another excellent method is the use of faradization, which acts rapidly and permanently. It is used by applying to the breast a copper plate moulded to the shape of the gland attached to one pole, while the other pole is attached to another plate which is moved from the nipple to the border of the gland. This treatment is a little painful at first, but its application is simple and easy.

Intestinal Worms in Children.—In the feces of 121 children in public institutions in Tennessee, Newton Evans (*South. Med. Jour.*, 1911, iv, 745) found that sixty had intestinal parasites, seventeen having two varieties, and two having three kinds of

worms each. The *uncinaria* was the most common parasite, the *ascaris lumbricoides* second, the *trichocephalus dispar* third in frequency. The two most important lessons to be learned from the results of this examination are, first, the necessity of teaching in season and out of season, and particularly in the public schools, the importance of personal cleanliness and personal hygiene, and especially is it important to show to the people living in the country districts the necessity of providing for adequate and safe disposal of all human excrement; second, it is the physician's duty to make a more careful and complete examination of his patients, this to include a microscopic examination of the fecal matter, and if parasites are present, to see that the patient is relieved of his infection.

Ileo-ileocolic Intussusception.—M. S. Kakels (*Amer. Jour. Surg.*, 1911, xxv, 363) records a case of ileocolic intussusception in a child of five years. A small adenoma attached to the wall of the ileum formed the apex of the intussusceptum. Recovery followed resection of twelve inches of gangrenous intestine.

Sarcoma of the Thymus.—W. Sheen, C. A. Griffiths, and H. A. Schölberg (*Lancet*, Nov. 4, 1911) record two cases of primary sarcoma of the thymus in boys of seven and eighteen years. In the first case the bilobate character of the growth as revealed at operation, coupled with microscopic examination of some of the pieces of growth then removed, allowed a probable diagnosis of sarcoma of the thymus to be made during life. Both cases were in young males and showed an acute onset; dyspnea, at first in attacks; dilated veins of the neck and thorax, swelling of the lower part of the neck, and dulness over the manubrium. Direct laryngoscopic examination was of value in determining the site of the obstruction. Division of the manubrium sterni and the removal of portions of growth pressing on the trachea permanently relieved dyspnea. The clinical conditions unfortunately seem to show that there is little hope of ever getting a case so early that the growth can be entirely removed.

Acetonuria in Childhood.—Examination of the urine of 662 children shows R. S. Frew (*Lancet*, Nov. 4, 1911) that acetonuria occurs in childhood with great frequency. In the large majority of cases the carbohydrate starvation necessary for its production is caused by a temporary failure of digestion. This loss of digestive power can be brought about by mere change of diet. It is more easily set up the younger the child, and that the digestive instability becomes less marked as age advances. About three days are required before the digestive processes can accommodate themselves to a change of diet. Disease, with few exceptions, has no influence on the production of acetonuria in childhood.

Spread of Bacterial Infections from the Nasal and Nasopharyngeal Cavities by Way of Lymphatic Channels.—A. L. Turner (*Edinb. Med. Jour.*, 1911, U. S., vii, 409) says that the part which has been assigned to lymphatic vessels in carrying infection from the upper air-passages to the cerebrospinal cavities

is largely speculative, and that definite pathological proof of the same is still wanting. Some writers have given to lymphatic channels between the nasal and accessory nasal cavities on the one hand, and the central nervous system on the other, a position which is hardly justified by anatomical facts as at present known. Even granting that future investigation may demonstrate a well-developed network of intercommunication, the lymph-flow through it will take a direction from the brain toward the nasal cavities and cervical lymphatic glands. Consequently the danger of meningeal infection by such an avenue from organisms in the nasal cavities will be diminished. The experiments of Flexner which show that the meningococcus will pass from the meninges into the nasopharynx and that the nasopharyngeal mucous membrane thus serves as a gate of exit for the organism, furnish experimental evidence upon this point. In the great majority of cases of chronic nasal suppuration in which an intracranial complication has developed, evidence has been found demonstrating the spread of the infection through disease of the contiguous bony wall. In cases of meningeal infection, however, in which no chronic nasal disease has existed, and in which destruction of the bony walls has therefore not been possible, some other path of infection must be looked for. This may be, and in some cases has been, definitely shown to be by venous channels. It will require further investigation, first along anatomical lines, and secondly by careful microscopical examination, both in experimentally induced meningitis and in fatal cases in which nasal and accessory sinus disease has furnished the primary focus of infection, to prove that such infection may take place by lymphatic channels.

Vincent's Angina.—The treatment which E. H. Place (*Bost. Med. Surg. Jour.*, 1911, clxv, 720) has found most successful is swabbing with hydrogen peroxide full strength or diluted one-half until the ulcer is pretty clean and then painting with 2 per cent. solution of chromic acid, once daily. The peroxide is used for its free oxygen and its mechanical effect in removing membrane so that the chromic acid may reach the base of the ulcer. The combination worked much better than either alone. Cure occurred rapidly, in from two to six days with hardly an exception.

Treatment of Infantile Eczema by Changes of Lactation.—G. Variot (*Gaz. des hôpitaux*, Nov. 7, 1911) says that generalized eczema is much more frequently seen in children that are nursed than in the artificially fed infants, who have intertrigo of the buttocks and thighs from irritation, but no generalized eczema. When this occurs it is sometimes necessary to wean and begin artificial feeding; in other cases it is sufficient to change nurses, or to add to the feeding a few bottles of artificial food in place of breast feedings. There seem to be some samples of human milk that have a direct tendency to cause eczema, why we cannot now say. The mothers of the eczematous infants are nervous women,

who have griefs or worries; in other cases they have passed the fortieth year of life, or have had the return of the menstrual period very soon after confinement. It is rather the quality of the milk than the quantity that causes the trouble. The author treats the eczema by substituting several bottles of superheated or homogenized milk for the breast feedings; bathes the child all over in starch baths at 36° C., then dries and heavily powders the skin. If the eruption is of the weeping variety on the thighs he covers it with zinc oxide vaseline, to protect from irritation by urine. Every night there is given an injection of warm chamomile tea or simple warm water. The results of these changes are rapid relief of the eruption.

Epidemic Poliomyelitis.—Simon Flexner and P. F. Clark (*Jour. A. M. A.*, 1911, lvii, 1685) say that the virus of poliomyelitis has been detected in the central nervous system, including the intervertebral ganglia of affected human beings and monkeys. The virus has been demonstrated in human poliomyelitis in the mesenteric glands, the tonsils and pharyngeal mucosa. It has been detected, in monkeys experimentally infected, in the spinal cord and brain and the intervertebral ganglia, the nasal and pharyngeal mucosa, regional lymph-nodes after a subcutaneous inoculation, mesenteric nodes, salivary glands and the cervical and prevertebral lymph-nodes. Of these, the only location in which the virus appears to occur with any constancy is the nasopharyngeal mucosa. In experiments by the writers, the tonsils and attached pharyngeal mucosa, rendered free from bacteria by treatment with a 0.5 per cent. solution of phenol, emulsified, and employed for combined intracerebral and intraperitoneal inoculation of monkeys set up, after the usual incubation period, paralysis and the other symptoms and characteristic lesions of poliomyelitis. Hence it can be concluded that the virus exists in the tonsils and pharynx of human beings who succumb to poliomyelitis, as constantly as in monkeys after an intracerebral inoculation. The virus has not been found in the blood of human beings; and it has been detected in the blood of the monkey, at the height of the acute disease, only when large quantities are withdrawn and injected intravenously in a healthy monkey. Ten and even 20 c.c. of human blood taken at the height of the disease were injected partly intracerebrally and partly intraperitoneally into monkeys, but without producing any result. Cerebrospinal fluid was obtained from two human cases of poliomyelitis during the preparalytic stage of the disease, and with it monkeys were inoculated intracerebrally, but without causing any noticeable effect. This negative result does not indicate that the virus may not be present in the fluid at an earlier period and before any symptoms whatever appear, but it shows that if present there, it tends quickly in human beings, as in monkeys, to leave the fluid and become established in the nervous tissue. Previous experimenters have succeeded in implanting only about one-half the human strains of the poliomyelitic virus on monkeys.

The writers have succeeded in implanting on monkeys all the ten strains of human virus with which we have experimented. In order to succeed in all instances, it is necessary to inoculate emulsions of the human spinal cord, and preferably to make double inoculations into the brain and peritoneal cavity. In making the subsequent transfers of the virus, emulsions should again be employed until the human virus becomes adapted to the monkey, when filtrates may be substituted. The adaptation is accomplished apparently more readily and quickly with some strains of virus than with others. The human strains of the virus not only infect monkeys less readily than do the modified or monkey strains, but the experimental disease produced by them is less severe and less fatal. Many of the monkeys infected with the early generations of the human virus tend to recover either completely or with residual paralyses; while after the strains have once become wholly adapted to the monkey, the paralytic disease appears in a more severe form, and recovery rarely, if ever, takes place. Coincidentally, the degree of infectivity rises, so that exceedingly minute doses of a filtrate are capable of producing constant infection. It is not improbable that the artificially evolved monkey strains of the virus may have lost, in some degree, power to infect human beings.

Epidemic Cerebrospinal Meningitis in Children, Treatment with Antimeningitis Serum.—A. Papapanagiotu (*Arch. de méd. des enf.*, Nov., 1911) has observed an epidemic of cerebrospinal meningitis in the city of Athens during the past year. He observed especially 20 cases, fourteen of which were treated by the author with antimeningitic serum only. They were aged from eight months to ten years. Three occurred in January, eight in February, two in March, and one in April; this shows that the disease is especially seen in cold weather; in spring the causative agent having disappeared. The author believes that the meningococcus of Weichselbaum is carried about from the nasal mucous membrane of those who harbor it by means of handkerchiefs, towels, and other objects which have come in contact with the nasal and pharyngeal discharges. In some cases the individual remains healthy, except for a nasopharyngeal catarrh, and carries the germs about with him to be communicated to others. If the patient contracts meningitis he is then isolated and remains in one place, thus becoming less dangerous. The author did not observe any two cases in the same family. Cold and humidity both favor the growth of the meningococcus. Children remaining in the same room with the sick did not take the disease in any case. The diagnosis of cerebrospinal meningitis in children is rendered difficult by the fact that the early symptoms are often those of the respiratory or of the gastrointestinal tract. The most characteristic early symptoms are slowing of the pulse, contracture of the neck, back and legs, general hyperesthesia, exaggerated reflexes, and increased tension of the anterior fontanelle. It is very necessary to make

an early diagnosis if the best results are to be secured from serotherapy. In every case where this disease is suspected an exploratory puncture should be made and the cerebrospinal fluid examined. The results obtained by the author with the serum were truly surprising to him. Even cases which occurred in nursing infants recovered, while these cases have heretofore always been fatal. Perhaps the reason of these better results is that the cases were all treated in private houses, which would make it possible to begin treatment earlier than if they had been carried to a hospital after the necessary delays. The earlier the case is treated, the more certain are the good results. If the serum could be used on the first day of the disease all the cases might be cured, however rapid the appearance of the exudation. Two cases were treated at the end of twenty-four hours; the other ten from the third to the fourth day. The favorable effect of the serum appeared after the first injection, and was still more marked after the second. The fever disappeared and the general symptoms improved. In prolonged cases the favorable effect is also seen. In addition to the action of the serum injected the spinal puncture removes a certain number of microorganisms with the fluid withdrawn. The duration of the disease was shortened, the evolution modified, and a large number of symptoms were never present or were imperfectly represented. The diagnosis in the author's cases was confirmed by finding in the cerebrospinal fluid the meningococcus and polynuclear leukocytes; the effect of serum was to cause the fluid to become clear. It seems best to inject large amounts of serum, on account of the extent of the lesions to be affected. Under two years of age the author injected 30 c.c.; below this age ten to twenty were used. The injections may need to be repeated three or four times to entirely stop the symptoms. The necessity of such repetition is better indicated by the appearance of the cerebrospinal fluid than by the clinical symptoms. Pains in the joints and an urticarial eruption have been noted as a result of the injections.

Treatment of Noma with Salvarsan.—M. Nicoll, Jr. (*Arch. Pediatrics*, 1911, xxviii, 912) says that during the spring and early summer of 1911 there occurred an unusually large number of fatal cases of noma in the city of New York. At the Scarlet Fever Hospital of the Department of Health there were eleven cases and nine deaths. Observations of this disease, extending over many years, especially at the New York Foundling Hospital, together with the study of most of these eleven cases, justifies the writer in arriving at the following general conclusions: The disease is essentially one of contagious disease hospitals and institutions for young children, but few typical cases having been reported from other sources. It is very largely confined to children under five years of age. It attacks almost wholly those suffering from marked malnutrition, and whose resistance has been lowered as a result of previous disease. Measles has long been regarded as one of the predisposing causes. In the eleven

cases mentioned, four had an antecedent attack of measles during their convalescence from scarlet fever. During the occurrence of an epidemic of noma a large number of minor ulcerative or ulceromembranous conditions are found about the mouth and gums in otherwise healthy children, showing the same organisms as those found in true noma, but showing little tendency to spread. In the epidemic at the Scarlet Fever Hospital there was no positive evidence of direct contagion, the cases being scattered over five floors of the building. Occurring, as it does, in patients in a low state of nutrition, the disease shows little tendency either to spontaneous recovery or to yield to local treatment, or even be influenced by radical surgical measures—curetting and removal of diseased tissues. Occasionally, a sequestrum of dead bone is formed, sharply marked off by healthy tissues and spontaneous healing occurs. In the eleven cases mentioned one took this course—that which occurred in a patient in previously fair general health. In another the same process was seen after treatment by salvarsan. The other nine died after treatment which varied from the application of strong caustics, and frequent cleansing of the parts, to removal, under an anesthetic, of all the visible diseased tissue, including bone. It cannot be said that radical measures had any apparent effect on the progress of the disease. Indeed, in some cases they seemed to act adversely. The writer gives the history of the case which recovered after two injections of salvarsan. A noticeable local reaction, consisting in increased swelling and redness in the infected cheek twelve hours after each injection, was also observed in another case following each of two injections and which did not recover. The latter was one in which the disease made an unusually rapid progress and involved both sides of the face in a patient suffering also from severe scarlatinal nephritis, with marked edema of the face and extremities. Nicoll says that it would seem advisable even in the absence of positive evidence that spirochetæ are the specific organisms of noma to make use of salvarsan in every case which does not immediately yield to local treatment, for it cannot be denied that other remedies have had little or no effect in controlling this horrible disease and the use of salvarsan is at least logical.

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ORIGINAL COMMUNICATIONS.

THE MIDWIFE.*

HER FUTURE IN THE UNITED STATES.

BY

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YOUR Committee has asked of us to answer three questions:

"Has the trained and supervised midwife made good?"

"Shall midwives be licensed, and shall midwives be abolished?"

We have endeavored to follow closely the Committee's wording and have divided our paper into three parts, each part answering one of these questions.

We hope to show you in the following pages that the midwife never has and never can make good until she becomes a practising physician, thoroughly trained; that midwives should not be licensed save in those States where they are so numerous that they cannot be abolished at once, and concluding with the third question, by showing a system whereby the mothers of the future shall receive in their hours of greatest need the attention of men and women thoroughly grounded in obstetrics.

"Has the trained and supervised midwife made good?" In England the midwife has always done the brunt of obstetrics, save in the families of wealth and education. We find that the midwife was licensed until about 1810. During the nineteenth

* Read in the Section on Midwifery of the American Association for the Study and Prevention of Infant Mortality, Chicago, November 16-18, 1911.

century she was, in the main, dirty and unscrupulous. Finally, such a condition was reached that popular sentiment demanded a change and the Midwife Bill was passed in 1902, in spite of medical opposition. This has given England a fairly well-trained cleanly midwife, in place of the dirty midwife and the careless practitioner, but it has not instituted a new system, and in the light of modern medicine, it is of questionable advantage to the community, for it provides a double system in obstetrics; the midwife but scantily trained, depending upon the physician who is not certain to respond to her call.

Let us see just what this means. Some 30,000 women have taken enough practice away from the physicians to obtain a livelihood. Unquestionably the field of the physician has been invaded and the community is the loser because this form of practitioner is a make-shift, admittedly incapable of coping with the abnormalities of pregnancy, labor and the puerperium.

The more midwives there are and the more successful they are, just so much the worse for the community at large which is thereby being supplied by second-class service. And this is more true in England than in America for the English system of medical education averages far higher than in the United States of America.

With such inadequate training and such meager provision made for the supervision of the midwife, working out of harmony with a growing proportion of the medical profession, we can feel assured that the midwife in England has not made good when viewed in the light of the greatest benefit to the community as a whole.

Let us now turn to the continent of Europe to see how the question can be answered.

In practically the whole of Europe obstetrics has always been conducted by midwives and the system of training and regulation is much the same in all these countries, certainly the differences between the midwife in Italy, France, Austria and Germany are very slight indeed. As we have had the opportunity to study thoroughly the question in Germany let us take up the situation there in detail, and see the exact position of the German midwife. We feel that a study of her position will show not only the breadth and thoroughness of her training before she is allowed to assume definite responsibility, but also the complicated and complete supervision regarded as essential according to German ideals. Such a study we feel will show us what preparations we

must be ready and able to make should we decide to adopt a system with the midwife as the solution of our present condition and also what results we may fairly expect to obtain from such a system.

In Germany practically all the normal obstetrics both in and out of the kliniks is conducted by midwives. To be sure, an increasing number of persons are by the process of education and cultivation appealing to the physician for at least his supervision at such a trying time. In Germany all classes are represented in the schools for midwives from the professor's daughter to the simplest peasant girl.

We must realize that Germany has been training midwives for generations, to understand her hold upon the general public. The trained midwife followed as naturally in the course of development as the trained physician, and we find with the knowledge of the necessity of clean obstetrics, stringent laws were passed for her education and regulation.

The German midwife of to-day is trained in the government kliniks by university professors who are salaried by the state, the same professors in the main as those who are responsible for the training of the medical students. In most cases the midwife course is six months, all of which time she lives in the hospital where she is trained. Her text-book is issued by the government and constantly revised so as to be up to date. This she must know almost by heart from cover to cover. This book treats of anatomy, including the entire skeleton: the nervous, alimentary, and circulatory systems as well as the genitourinary tract. There is also considerable physiology and bacteriology as well as normal and pathological obstetrics. Besides this there is a statement of her legal status. This book is supplemented by lectures and explained by recitations occupying in all about twelve hours a week throughout the course.

She also has thorough drill in the principles of the diagnosis by means of abdominal palpation, auscultation, pelvimetry and vaginal examination. She has almost daily drill in the "vaginal touch" by means of the manikin and the fetal cadaver.

She is taught the most essential tests for the examination of the urine. She is required to make vaginal examinations and to deliver a certain number of cases in the confinement wards under the direction of the resident physicians and graduate midwives. Here also she is taught—as far as is possible in the limited time of her instruction—the principles of aseptic technic.

At the conclusion of the course the midwife must pass a rigid examination both oral and written on the subjects she has pursued. Besides answering questions for some fifteen minutes, the candidate must demonstrate her knowledge by making a diagnosis of presentation and position in the mannikin, outlining her methods of procedure in the given case. As we were present at such an examination we can definitely state that it is a thorough and severe test of the candidate's knowledge of the subjects—it is one that the average graduate of an American medical school would have difficulty in passing with distinction.

Now let us turn to the midwife in practice and see what her position is. She is constantly under the supervision of a physician in the government service whose duties are in a measure the same as our medical examiner plus many of those of a Board of Health officer.

To this officer the midwife must report before she enters upon her practice in the given locality; he examines her credentials and establishes her in practice and so long as she remains in his jurisdiction her work is constantly subjected to his supervision. To him she must report immediately all still births and deaths, all cases of puerperal fever and ophthalmia neonatorum. Her home, her equipment, her clothing and her person must always be ready for his inspection. She may lose her right to practice if her house is dirty or if she is caring for an obstetrical case under her own roof. The contents of her bag and her case book are outlined by law. She is required to wear clean and washable gowns when in attendance on cases. Her hands must be clean and the skin and nails in good condition at all times. She must report to this officer any septic lesion or ulcer on any part of her body. Violations of these rules will lead to swift punishment—fine or imprisonment, or both.

The midwife must also report immediately to some local physician any symptoms suggesting eclampsia or miscarriage or any serious complication of pregnancy.

She must be equally prompt in reporting any case of antepartum hemorrhage, contracted pelvis, or abnormal presentation—and this includes a breech presentation. Should the second stage last more than two hours without progress; the pulse or temperature rise above the limit considered not abnormal in obstetrics; the fetal heart rise above 180 or fall below 110; the placenta remain in the uterus too long after delivery; the uterus fail to contract and continue to bleed; or the perineum rupture during

delivery, the midwife in each and every instance must notify a physician in writing of the exact condition or communicate with him personally over the telephone. And the physician must in such a case respond at once unless actually engaged on a case that requires his immediate attention when he must so communicate to the midwife or the messenger. Should the midwife or the physician fail to obey these laws they are held liable to punishment.

In case an emergency arises where time is of utmost importance and her powers are limited by law from doing what she knows to be necessary, after notifying the physician, or even before if the emergency demands, it shall be her duty to do whatever seems necessary for her to perform—save only version and instrumental obstetrics—but in each and every instance she must communicate as soon as possible with the medical examiner, telling him the exact circumstances and abiding by his decision as to whether or not her action was justified.

This gives a rough picture of the duties and responsibilities of the German midwife and the careful supervision exercised over her. Added to all this she must return every few years for re-examination after a few days' residence in the klinik so that she will keep up to date.

But let us see if the midwife in practice lives up to all this. In the first place, one observing the work of the midwife in the confinement ward is struck by her lack of what is known as the "aseptic conscience"; that is, the knowledge that one is or is not surgically clean. After faithfully scrubbing her hands for the allotted fifteen minutes, the midwife will unconsciously touch something outside of the sterile field and continue as if surgically clean. This the writers have often observed. Of course there are exceptional pupil midwives who do not fall into this error and these are usually the ones who have graduated as nurses before beginning the training in the midwife school.

But one cannot help feeling that if these breaks in aseptic technic are made in the hospital where the pupil is working under vigilant instructors how much more apt she will be to fall into unsurgical habits while working in a peasant's home. This carelessness is even more marked in the older midwives when they return for instruction.

Obstetricians in Germany are far from satisfied with the present system. They admit it is illogical but it is so firmly established it seems impossible to make a change. *Peurperal*

fever is much more prevalent than should be. Prof. Bumm so states in his "Text-book on Obstetrics," in one year out of 2,000,000 births 5,000 deaths from puerperal fever were reported and of course many more failed to be accurately reported.

A year or so ago a Berlin physician, prominent in gynecology, wrote to a committee of the American Medical Association asking for information in regard to the number of deaths from puerperal fever in this country, as he understood that we were without midwives. The answer was made that not only were we without vital statistics of any value, but that we were in many states overrun with midwives. The Department of Medical Economics of the *Jour. of the A. M. A.*, referring to this correspondence adds "Midwifery is not so well regulated in this country as in Europe, and yet the harm done is probably less since midwives are not so numerous."

We have in Germany a system of training and regulation of the midwife so complete as to be almost ideal, a system of seemingly perfect harmony between the midwife and physician. But let us look a little closer at this very point and we will see why the thoughtful German obstetrician is dissatisfied with the present scheme.

There are rules for harmony laid down in the statute book, but the midwife is not well paid and it is profitable for her to deliver the case if possible without calling in the physician so she is all too apt to let the case go as long as seems safe without her falling into the clutches of the law. Then too the physician when called to such a case is far from being as careful as if it had been his case from the beginning, for it is so easy to say that had he been called earlier all would have been well. The obstetrician cannot give his best care to a case under such circumstances. Then there is the other great defect in the system that unlike any other branch of medicine there are two standards of excellence offered to the public.

Thus we see instead of perfect harmony a waste of precious minutes because of greed and ignorance; divided responsibility because of the nature of the system and also because of jealousy; and two standards of skill where science and logic demand but one. And so even on the continent where ages have given the midwife an established position yet the leading obstetricians will tell you that the midwife has not made good.

It is almost absurd to ask the question: "Has the trained and supervised midwife made good in America?" We have never had

a system of training of midwives worthy of the name; neither have we had any successful method of regulation, with the single possible exception of New York City. The fact is, the midwife is not a native product of America. They have always been here, but only incidentally, and only because America has always been receiving generous importations of immigrants from the Continent of Europe. We have never adopted in any State a system of obstetrics with the midwife as the working unit. It has almost been a rule, that the more immigrants arriving in a locality, the more midwives will flourish there, but as soon as the immigrant is assimilated, and becomes part of our civilization, then the midwife is no longer a factor in his home.

"Shall Midwives be Licensed?"—We suggest the following as a brief and fair summary of the minimum training which may be ordinarily demanded to-day of those who are to assume the care of the expectant mother. Ability to make a diagnosis of pregnancy, and to determine whether the bony development of the mother, is normal enough to make labor a safe procedure; knowledge of how to examine the urine and to test the blood pressure of the pregnant woman, so as to receive the first warning of threatened eclampsia. Ability to conduct a normal case of labor, and this is first of all asepsis—not only the theory, but the trained instinct of surgical cleanliness, and how it can be maintained. Ability to make the internal examination. A knowledge of anesthetics, ability to properly care for the breasts, to supervise the nursing and proper hygiene of the infant. In the light of modern medicine, we know these are the simplest requirements and the right of every mother in civilized communities, but as we read through this list, how many teachers of obstetrics would care to undertake the training of the midwife, as we have seen her in the city slums? How many would care to feel the responsibility for her work in practice?

The story of medical education in this country is not the story of complete success. We have made ourselves the jest of scientists throughout the rest of the world, by our lack of a uniformly high standard. Until we have solved the problem of how *not* to produce incompetent physicians, let us not complicate the problem by attempting to properly train a new class of practitioners. The opportunities for clinical instruction in our large cities are all too few to properly train our nurses and our doctors. How can we, for an instant, consider the training of the midwife as well?

The midwife is called in question to-day not because of the popular demand for her services, but because investigation into disease and death, has revealed her working in her filthy surroundings, and has shocked the medical and lay public into action.

The midwife is willing to undertake maternity work that no well-trained obstetrical nurse would think of attempting because in the first place she is ignorant of the situation; she has the over-confidence of half-knowledge; she is usually unprincipled, and callous of the feelings and welfare of her patients, and anxious only for her fee. She looks upon her work as a legitimate form of livelihood, not as an ennobling profession.

But let us look at the picture from another standpoint; and consider that the midwife is licensed. The question of regulation is one that goes hand in hand with the licensing power. We can take it for granted that all will agree that the licensed midwife must be regulated. How is that to be done? The obvious answer is by legislation, but we know by experience that in America legislation without public sentiment behind the law is absolutely futile.

Let us suppose for the sake of argument that the impossible has been accomplished—that we have an aroused community and laws as stringent as those of Germany, for the regulation of the midwife. We must realize that it means in each community inspectors trained in medicine and paid by the Government to give their exclusive time to supervising the midwife, and not only that, but a medical profession forced by law to respond to the call of the midwife in trouble. Do you honestly think for one moment that we could accomplish this in America? But let us again grant all this as possible, and consider whether it would be worth while; by gradual steps we should have evolved a double system of obstetrics enforced by the law through well-trained medical officers and backed by popular sentiment. Would it be a success? We answer, "No!" It would be a double system—two standards of excellence which can never work together, and yet based on the assumption that they are interlocking parts of the same machine. Why should we adopt in obstetrics this double system? Certainly, there can be no more important branch of medicine than this, and yet with the possible exception of ophthalmology, we have no attempt in any field of medicine to adopt a double system of practitioners. Why should we not oppose the midwife on the same ground that we oppose the optometrist; both, because of their limited training, are incompetent

to bear the responsibilities they attempt to assume, and whereas the worst the optometrist is likely to do is to subject his victim to financial loss and injure his eyesight, the midwife can and has, by her ignorance alone, cost the community the loss of two lives, and has not only escaped any punishment, but has been rewarded by a fee for her activities. And when we picture the unnecessary and enduring sorrow her ignorance has caused, we should think well before we put such power in her hands.

"Shall the Midwife be Abolished?"—We feel that this question should be answered emphatically in the affirmative when and where it is possible. We feel that in this position we are but keeping step with progress in preventative medicine and following out the logical solution of what is best and safest. But we go further and feel certain that the untrained and unscrupulous physician should be put in the same class with the midwife and laid aside as soon as is possible by guarded legislation and education of the public conscience. We are not satisfied with generalities. We feel that sweeping condemnation is not enough to bring about a change of any value. Let us not fall into such an error but show definitely and in detail just exactly how these much-needed reforms can be made. If our remarks seem didactic in dealing with conditions outside of our own state among surroundings we know little of—pardon us, we mean no possible offense. We are dealing with a problem about which it is next to impossible to know the details and the facts except at first hand.

To begin with let us show you the condition in Massachusetts and what we feel to be of vital importance in our own State. By the medical practice law midwives are excluded from the practice of obstetrics. They have been found violating the law and in two or three instances have been caught and convicted and have paid fines for practising medicine without a license. In spite of this some hundred and fifty women are practising as midwives. They are for the most part poorly trained and incompetent women. Their stronghold is in the manufacturing cities of about 100,000 population largely composed of immigrants. There are a few midwives in Boston but their practice is small. We feel that in Massachusetts under such favorable circumstances that the State and local medical societies should see to it that the law plainly written on the statute books be enforced and at the same time by the extension of dispensary systems provide for the immigrant population.

In States where the midwife is practically unknown see that

the medical practice law excludes the possibility of midwives practising within the limits of the State.

In States where the midwives are active but not numerous or well organized, license and regulate those in practice; outline for them the minimum standard for their cases and enforce at least this by taking away the licenses of those who violate the law. Renew the licenses every year and issues no new ones. Then the midwives will gradually be excluded from practice by their own incompetency and by the lapse of time. At the same time earnest endeavors must be made to provide competent obstetric care for the impecunious.

In States now overrun with midwives the task is harder but we think neither discouraging nor impossible. Have a thorough system of examination given in German, French and Italian and enough midwives will be able to pass such an examination to care for those who will only be satisfied with the obstetrics of the midwife. Then by inspection keep these women up to the highest standard they are capable of pursuing. Only allow those to practice who can pass this examination and have the examination and the license to practice an annual affair. Then by gradually raising the standard and by providing dispensary care for all who will apply, the problem in a few years would simplify itself. Of course this is with the understanding that the schools for midwives which have been proven on inspection to be merely diploma mills be abolished and the midwives drawn to supply the demand from the graduates of the continental schools—institutions with which we can never hope to compete.

We wish to present to you in detail two successful systems for providing obstetrical care for the poor of our cities. We offer these two not as better than other institutions elsewhere in the country, but merely to present the working plan of a system that can be applied with modification to any surroundings.

We first wish to show you the working of the Boston Lying-In Hospital, which last year cared for the confinement of 829 women in its wards, and 2,007 women in their own homes.

The patients are supervised in a pregnancy clinic, from the date of application, as soon as the condition is diagnosed until they fall in labor. The pregnancy clinic established May, 1911, is supervised by a corps of obstetricians who are assisted by the house officers and nurses in carrying out the work. When the patient falls in labor, she is either delivered in the wards of the hospital, or in her own home, depending on the nature of her case,

her place of residence, her inclination, and to a lesser degree, her ability to pay. If she is confined at her home, she is attended by a student externe. These student externes are for the most part under-graduates of the Harvard Medical School or post-graduate students from other institutions. How successfully this has worked out can best be shown by the statement that during the past year these 2,007 cases were delivered with no maternal mortality. Another encouraging and very practical feature has been that these 2,007 patients voluntarily contributed to the support of the hospital the sum of \$2,571, and the total expenses of the out-patient department were \$1,763.18, leaving a net gain of \$807.82.

We feel that some such scheme as this can be carried out in every medical center, where medical schools are near at hand. In the smaller cities, away from medical schools, the young doctor, the visiting nurse association, and a few beds in a hospital, give a very excellent substitute for this more elaborate system. Let us look at such an institution at work. The city of Manchester, New Hampshire, has 70,000 inhabitants, including a large foreign population. In a central location is the building of the City Mission. Application is made to this institution by those unable to employ physicians. The home is visited, the need determined, and the district nurse is called in. About 150 obstetric cases are cared for annually. These are attended during confinement by the young physicians of the city who are members of the local medical society, and have signified their desire to be on call for obstetrical cases among the poor for two months each year, thus the young practitioner gains experience, and may even acquire patients for his future practice. For those cases which present complications, which cannot be properly dealt with in the patient's own home, there are three beds in the local hospital at the disposal of the City Mission. This institution is supported by public subscription, including donations from the various mill owners and manufactures of the town, and the various women's clubs of the churches. Such a plan it will be seen includes the social worker, the district nurse and the physician. To this is added possible hospital care in critical cases.

This system is efficient, economical and has proven satisfactory by years of service. We see no reason why it cannot be applied with modification in the smaller cities.

CONCLUSION.

The object of the meeting of this section of our National Society we believe to be to fully consider the facts presented concerning midwives in general and the midwife in America in particular. From this consideration we should eventually draw conclusions and lay out a policy national in scope. Were such a policy accepted by the several states, each separate community must consider local conditions, opportunities and resources and apply the principles of such a policy as far as is possible to meet these given conditions. We all should return to our separate homes determined to carry out the plan which will finally give our community the best system of obstetric care which is practicable under the circumstances.

So let us be far-sighted in our plans and produce a policy nation-wide in scope and yet plastic enough to be shaped to the needs of each and every community. And let it all tend toward that goal for which we must all sooner or later strive, a single standard of obstetrical excellence, at the disposal of all, rich and poor alike. A standard which only takes into consideration the best possible, immediate, attention for the welfare of "All women in the perils of childbirth."

31 MASSACHUSETTS AVENUE.

THE PREPARATION OF THE PATIENT BEFORE THE OPERATION.

BY

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WHEN a gynecological operation has been decided upon, the preparation of the patient for the operation comes next under consideration. The surgeon should here exercise the privilege conceded to him and place the patient entirely under his control for several days or even a week previous to the operation, providing the case is not one requiring immediate attention. It is to the advantage of both the patient and the surgeon to place her in the best frame of mind before operation and promote a normal functional activity of all the organs of her body. Her mode of life should be so regulated that it be in keeping with health and vigor. Sufficient bodily exercise should be allowed to keep up a proper muscular tone, but the exercise should not be carried to the point of fatigue.

FOOD.

The question of food is an important one, but it is unwise to curtail her food or to place her on a strict diet. The patient should be allowed to select the food best suited for her taste and digestion. A judicious oversight of her daily menu is, however, advisable. Proper amounts of carbohydrates, proteids, and fats to make up a sufficient amount of calories should be given, and to accomplish this it is not necessary to resort to scientific measurements, or to some complicated system for the determination of the caloric values of foods. A few slices of bread with plenty of butter, a pound of meat in one form or another, several glasses of milk and a few eggs, a certain amount of fruit and fluids, will make up a sufficient amount for the daily calories necessary. The consumption of a large amount of food at one sitting is to be discouraged. A sufficient quantity, however, should be taken at each meal to satisfy the wants and appease hunger, but the meals should not be carried to a point of satiety. The feeling of hunger is a good indication for taking nourishment and should be heeded by the patient. Patients with very poor appetites and those who have even an aversion for food should be encouraged to take some concentrated, nutritious food at regular intervals and it will be surprising the quantity of food which may be consumed and assimilated that way. Careful feeding of patients, even for a few days previous to operation, is very beneficial and certainly reacts favorably on the power of resistance of the patient.

SKIN.

The patient should see to it that her skin is in good condition, so as to get the full benefit of the eliminating function of this organ. Skin cleanliness is of first consideration and this is to be accomplished by daily bathing immediately before retiring. The bath should consist of hot water and soap and the patient should not remain in the bath-tub longer than is necessary to get a good thorough washing. After the patient has washed herself thoroughly and her skin has become thoroughly warm, she should be dried quickly and at once put to bed, where she is to remain until the rising-time in the morning.

SLEEP.

The regulation of her sleep is of importance. Retiring to bed at a seasonable hour, promotes a restful sleep and a not too early

rising encourages longer hours for rest in bed. Hypnotics are to be discouraged as much as possible, but in many cases a resort to medication has to be made; under such conditions the selection of the hypnotic is of considerable importance. In many cases a mild bromide administration will be sufficient to bring about a restful sleep; in other cases the more powerful hypnotics will have to be resorted to. It has been my experience that restful sleep can be brought about in many cases by the administration of a teaspoonful of 5 per cent. solution of chloral hydrate. This drug is particularly efficacious in cases with high arterial tension, in fact, patients with high arterial tension should receive small doses of chloral hydrate two or three times a day. This will materially help to induce sleep during the night. Under certain conditions, however, sleep will only be induced by the administration of a hypodermic of morphine. This will be the case where patients suffer with pain as a result of the pathologic process which calls for the operation. To induce sleep in the type of cases mentioned before is of particular importance as nothing contributes to shock so much as the presence of pain. By bringing about relief of pain shock will be lessened and the power of resistance of the patient will be preserved.

MODE OF LIFE.

All excitement should be discouraged and a normal equilibrium of the nervous system is to be sought for. Fear of operation should be overcome as much as possible and in many patients this fear of operation can be overcome by explaining to them just what is to be accomplished by the operation. An intelligent woman will balance her nervous system far better if she has a proper conception of the nature of the ordeal she is to undergo.

GASTROINTESTINAL TRACT.

In cases with elective operation, where immediate action is not imperative the preparation of the gastrointestinal tract before operation is of great importance and consists more in the regulation of the diet than in the administration of medicines for obtaining bowel movements. The administration of cathartics or even purgatives is necessary in many cases and should be used when required, but not all operative cases necessarily require purgatives. It is an error to bring about free catharsis in a patient because

she is in need of an operation. All cathartics, as well as purgatives have certain effects on the general body system, and the selection of the kind of cathartic for each individual case should be governed by circumstances. A patient with a foul breath, coated tongue, frontal headache, mental and physical depression, sallow complexion, epigastric pain, certainly is in need of a cathartic irrespective of the need of an operation. In the presence of these symptoms it would be unwise to operate without giving attention to the gastrointestinal tract. The rectum and sigmoid should be unloaded by an enema, after which the administration of a cathartic suitable for the particular case is in order. The unloading of the rectum and sigmoid is as a rule a very simple procedure, but it is not so with the colon. Enemata and colon irrigations very frequently fail to bring about a desired result and we must resort to saline purgatives of which I prefer magnesium sulphate. I am in the habit of prescribing this remedy in a concise and definite manner. Only under exceptional circumstances do I administer this saline in large doses. I order my patients to dissolve a tablespoonful of Epsom salts in about 4 ounces of cold water and to take two teaspoonfuls of this solution every three hours until soft bowel movements are obtained. There should be little or no griping with this form of catharsis and if it does occur, the quantity of the saline so taken should be reduced.

Calomel is used only under exceptional circumstances. In cases with malarial infection, for instance, calomel acts exceptionally well. The drug is also used as a cathartic when lues is present. From all other cases calomel is purposely withheld. While calomel is undoubtedly one of the most important and useful drugs in the Pharmacopeia, it has no proper sphere as a cathartic in the preparation of a patient for operation. There are a few physiologic effects of calomel that are known, but there are perhaps a great many other effects of this drug that are not known. The physiological effects that are known are of a nature in no way beneficial to a patient about to undergo an operation. Materia medica teaches that calomel is a tonic, alterative and purgative; that in small doses its effects are that of a tonic in the blood, but often produces an impoverishment of this fluid of the body. From the blood it enters the tissues where it remains for a considerable time, exerting an alterative influence on the cells. It stimulates most of the glands of the body to the production of pathologic secretion especially the salivary and

pancreatic glands. It has a tendency to accumulate in the liver and by its irritating effect it increases the flow of bile.

None of these effects are desired when calomel is administered as a purgative before operation. Calomel is very positive in its purgative action and this is doubtless the reason for its popularity. Both the small as well as the large intestine can be evacuated by other means as effectually as with the aid of calomel. Neither must the possibility of poisoning by its use be forgotten. It is in the experience of every one who administers calomel as a routine measure that he will meet with cases of stomatitis, mild and transient perhaps, but still undoubted cases of mild mercurial poisoning, shown by the foul breath and spongy gums.

For the past two years no calomel has been administered to my operative cases. Patients requiring laxatives receive cascara, licorice powder, A. B. & S. pills. If a cathartic is called for, they receive magnesium citrate or magnesium sulphate in small doses. Compound cathartic pills are very seldom used, and the same is true of castor oil. The majority of my patients go to the ether room with absolutely no cathartics. The rectum and sigmoid are emptied by enemata in all cases before operation. For a morning operation the enema is given late the previous evening and for an afternoon operation the enema is given in the morning.

Since adopting the method of little or no cathartic before operation, I have been convinced more and more that the teaching of the routine administration of cathartics and purgatives before operation is an error. Patients who have not been purged before operation will experience a smoother postoperative convalescence than those who have been subjected to purgatives or cathartics. It must, of course, be considered that the postoperative convalescence of a patient, after all, depends on many factors, and therefore this matter is of difficult diagnosis. The postoperative convalescence will depend on the nature and extent of the operative procedure, on the condition of shock of the patient, on the length of time on the anesthesia, of the power of resistance of the patient, on the various states of sepsis, etc., and, therefore, it is most difficult to compare the postoperative convalescence of patients. However, taking all things into consideration, and taking up the cases in classes, it will be found that the postoperative convalescence of the patients that have not been purged will be more comfortable, smoother, the reaction from the operation more prompt, the distress less prolonged than in the

class of patients subjected to free catharsis. The smooth post-operative convalescence of patients not subjected to purgatives is a striking matter and so is, also, the ease with which a bowel movement can be obtained after operation. A small enema of either plain soap suds, or one consisting of glycerine and water, a mild laxative, or a small dose of saline will in almost all cases bring about a bowel evacuation. The bloatings, the bowel distentions, the torments from gas retention, the inability to expel flatus, are all conspicuously absent and if present are so in a mild degree. When a patient has been freely purged she is more apt to suffer with gas formation and retention and it is more difficult to obtain a bowel movement from her. The gastrointestinal storms so to say, which the purgatives administered before operation bring about, can be brought to quiescence with difficulty, and while this storm rages in the abdomen the patient is mighty uncomfortable. Why raise a storm at all? Fifteen years ago when a laparotomy was performed the surgeon's anxiety about the case ceased only after he had obtained a bowel movement, and for a few days after the operation all his efforts were directed toward getting an evacuation of the bowels. When a patient has not been purged it is easy to obtain a bowel movement. If the patient is not distended with gas, has no cramps, passes flatus readily, little or no attention is paid to the bowels. It is not unusual for a patient to go four or even five days after operation without a bowel evacuation. If the patient is uncomfortable and the indications for the necessity of a bowel movement are present an enema or mild laxative is ordered earlier, but with patients who have flat abdomens and no symptoms, particularly if they pass flatus, the evacuation of the bowels is delayed for days.

NASOPHARYNX.

Inspection of the nasopharynx is necessary in all patients who will be subjected to anesthesia. The inspection is for the determination of the presence of abrasions, ulcer or suppurating foci, as well as for the condition of the teeth and tongue. A coated tongue may be indicative of many pathologic conditions as well as a state of disturbed digestion and certainly an attempt should be made to correct it if possible. The tongue should have a thorough cleansing as the coating on it swarms with microorganisms, many of them doubtless of the pathogenic variety. It is of importance to have as clean a tongue as possible before the anesthesia is

taken. A foul-smelling tooth socket or cavity harbors germ life in great quantities, sufficient, indeed, for the infection not alone of the gastrointestinal, but the respiratory tract, also. These foul-tooth cavities should be disinfected with peroxide and some antiseptic mouth-wash; abrasions, ulcers and suppurating foci should be touched up with mild solution of silver nitrate or tincture of iodine and kept as clean as possible with mild antiseptics. Strong antiseptics are to be avoided, as they are apt to injure the delicate epithelium of the nasopharynx and do more harm than good. The patient should be instructed to keep her teeth and mouth clean. Denuded surfaces in the nose cavity should be kept clean. During anesthesia a large amount of mucus is secreted and with an infected nasopharynx great quantities of pathogenic germs are swallowed with the saliva and mucus; infected particles may be inhaled into the respiratory organs and so the foundation is laid for suppurating foci in the gastrointestinal, as well as in the respiratory tract. Immediately before the administration of the anesthetic the patient should be made to gargle her throat with an antiseptic mouth wash and the nurse should see to it that this is done as thoroughly as possible.

HEART AND LUNGS.

Knowledge of the condition of the heart and lungs is of great importance to the surgeon. He should become familiar with all adventitious sounds in the heart as it will materially aid him in deciding on the nature of the operation to be performed. Systolic and diastolic murmurs about the heart have no significance as far as a surgical operation is concerned, providing there is present a complete compensation of the muscular action of the heart; in fact any murmur about the heart loses its significance as far as the surgeon is concerned when no symptoms are present indicative of a loss of compensation. In the presence of symptoms referable to the cardiovascular system, such as dyspnea, rapid pulse, irregular action of the heart, the surgeon faces a problem and due attention should be paid to these symptoms, but even under these conditions operative interference can be safely carried through, providing the operation is of a nature that will not tax the patient's resources too much. Under many conditions of disturbed compensation the surgeon may introduce effective treatment before operation and thereby succeed in restoring disturbed circulation sufficiently to undertake the necessary operative procedure.

A knowledge of the condition of the respiratory tract is of great importance. A careful examination of the chest, both anteriorly and posteriorly, will lead to the detection of abnormal pulmonary sounds, if pathologic states of the respiratory tract are present. The presence of any cough is of great importance to the surgeon, not alone in deciding, on the kind of an anesthetic to be used, but also whether this cough is of a nature that can be allayed by medicinal means or not. A cough that cannot be allayed by appropriate means is of such serious significance that it may be an absolute barrier to operation. There is nothing more distressing for a surgeon than to find a patient developing a cough immediately after an operation when an abdominal incision has been made. Coughing and vomiting are the most frequent causes of the reopening of an abdominal incision. Sometimes the cough is due to a nasopharyngeal irritation, or a chronic inflammation of the tonsils. Under all such conditions attempts should be made to correct cough before subjecting the patient to a gynecological operation where the abdomen has to be opened.

BLOOD PRESSURE.

Attention may here be called to the value of the findings of the blood pressure of the patient. A high arterial tension has always a significance and when present in a patient about to undergo an operation should receive attention. It has been found that the average normal blood pressure of an adult male is from 105 to 120 M.M., while that of a woman is from 90 to 110 M.M. Under certain physical conditions a pressure of a 130 M.M. will be normal. A tension, however, of 140 M.M. may be considered as abnormal. Under ordinary conditions a hypertension is accounted for by the habit of life of the individual. There is no doubt that over eating and insufficient bodily exercise is a prolific cause of arterial hypertension. Proper regulation of the diet and a judicious amount of bodily exercise will reduce the hypertension to a normal blood pressure in a great many cases. Should the tension not become lower by this means it will behoove the surgeon to be on the alert and, if possible, discover the cause of the increase blood pressure. While the subject of arterial hypertension is not well understood those who have given the matter attention claim that a high blood pressure is associated with arteriocalillary fibrosis. Nephritis, cirrhosis of the liver, autointoxication and general fibrosis, have, as a rule, an associated condition of hypertension.

KIDNEY.

The presence or absence of organic disease of the kidney is of importance. The urine should be collected under absolute cleanliness and subjected to a chemical and microscopic examination. If the chemical examination discloses the presence of albumin, then a very thorough and exhaustive urinary examination should be had at hand to know exactly the qualitative condition of the kidney excretion. The knowledge of the quantity of urine excreted daily is not of as much importance as the qualitative condition of the urine. If deficient urinary excretion is present attempt should be made to correct it if possible by appropriate means. It is a favorable sign if the quantity of urine excreted can be increased by the ingestion of water. If the urine contains casts and cellular elements in considerable quantity the surgeon should plan to bring the expected operation to an end as speedily as possible as a prolonged anesthesia reacts unfavorably on the pathologic state of the renal parenchyma. A short anesthesia should be particularly planned for by the surgeon, if the urine shows albumin and casts and microorganisms. We have learned to fear postoperative nephritis and if the urine shows pus cells, bacteria, casts and albumin, the shorter the anesthesia the less likelihood of the complication of postoperative nephritis. Deficient renal activity is not a contraindication to operation, but to undertake too prolonged an operation in its presence is inadvisable.

It has been the teaching and, perhaps this still holds good, that as an anesthetic chloroform is preferable to ether in cases with deficient renal function. This has not been borne out by our experience. Disturbed renal function has followed the administration of chloroform as often as that of ether, after prolonged operation. It is to be hoped that the more recent method of anesthesia with gas and oxygen will give better results in this class of cases and the indications are that much may be expected from this method of anesthesia.

If the renal function responds to dietetic, hygienic and medicinal measures instituted for the relief of deficient renal excretion during the period of preparation for operation, which will be shown by an increased quantity of urine excreted, by a rise of urine content, by a decrease of albumen, casts, etc., then the surgeon need fear no complication from this source, as the treatment instituted can be carried on after the operation. But

if only slight or no response occurs in the kidney function from the treatment, the surgeon must be on the alert to meet the complication that may arise from this source after the operation is performed. Organic disease of the heart, lungs, and kidneys are of the greatest importance to the surgeon and due attention must be paid to these lesions in the preparation of his patient for operation.

THE NATURAL RESISTANCE OF THE PATIENT.

Pardon me for touching on this subject, of which so little is known and so much left to the imagination. There is no doubt that the natural resistance of the patient is a distinct entity. The difficulty is how to estimate this force? Where does this force begin and where does it end? It has been suggested that one way to estimate this mysterious force in the patient is to enquire into the longevity of the various members of the family. If the patient belongs to a family of which a large number lived to a ripe old age, the inference is that the patient at hand has inherited a good "natural resistance." If a large number of the members of the family have died young the reverse would be the inference. In taking the history of the patient much may be learned of this natural resistance by inquiring about former illnesses of the patient or accidents which she may have passed through. What was the nature of the illness? Was it severe, was it prolonged? How did the body forces respond to the illness? If an accident, did recovery follow promptly or not? Did it take long before the natural forces returned or not? In this way much can be learned about the recuperative powers of the patient. Do slight bruises or cuts heal promptly? Is the nervous equilibrium easily disturbed? Does slight fatigue or exposure react unfavorably on her? Has she stygmata of degeneration? Has she an arched palate, long hair, long bones loosely jointed, adiposity, extreme leanness, astigmatism, irregular and supernumery teeth, unhealthy skin, flat chest and undersized mammae, etc.? All these points taken in conjunction will assist the surgeon in formulating in his own mind the probability of the degree of the natural resistance of the particular patient under consideration.

BLOOD EXAMINATION.

Under certain conditions the examination of the blood before operation by a competent hematologist will result in

valuable information, and establish many points in diagnosis. The facial appearance of a patient with fair skin and of delicate structures may simulate a condition of anemia, while a brown integument may hide a true anemia; a blood examination will settle all doubt. The presence or absence of leukocytosis lends additional data for a differential diagnosis. A systematic study of the blood picture will also reveal disease of the blood which may have escaped diagnosis. Much has been written on leukocytosis and its value in diagnosis, and while an increased leukocytosis is a good indication of the presence of inflammatory focus or pus collection, a normal leukocyte count does not necessarily exclude the presence of the two conditions mentioned before. An increase in leukocyte count has sometimes a negative and sometimes a positive value in diagnosis, and if a competent man is at hand to undertake these examinations it may lead to valuable information. Hematologists have given us the knowledge of phagocytosis, leukocytosis and the opsonic index and it is the clinician's duty to supply the material for the studies of the body fluids and the important rôle the blood plays in guarding health and in curing disease, when infection has invaded the tissues.

THE PREPARATION OF THE FIELD OF OPERATION.

The field of operation is prepared in a very simple way. After a general body cleansing which is accomplished by a bath and clean underwear, the field of operation, whether in the lower or upper part of the abdomen, is shaved and the parts washed off with soap and water. This is followed by a cleansing of the parts with alcohol and a wet dressing of bichloride of mercury 1 to 10,000 is applied. This dressing is kept in place by a snug binder and remains in position until two hours before the time of operation. Two hours before operation the parts are again cleansed with alcohol and a fresh wet dressing of bichloride is applied, this No. 2 dressing remains on the field of operation until the patient gets on the operating-table and by this time the skin and dressing, as a rule, are quite dry. With the patient anesthetized and on the operating-table the No. 2 dressing is removed and the skin cleansed with alcohol, followed by ether, after which the parts are painted with tincture of iodine full strength. Only one generous coat of iodine is given.

The preparation of the vulva consists in a shave and soap and water wash. The vagina is then douched with bichloride of mercury 1 to 5,000, after which the vulva is covered with a wet

bichloride dressing 1 to 5,000 and kept in place by a "T"-binder. When the patient is anesthetized and on the operating-table the vulva and vagina are washed with soap and water using plenty of sterile water for cleansing, followed by a thorough douche and wash of a 1 to 5,000 bichloride of mercury. The patient is then catheterized and she is ready for the operation.

NERVOUS SYSTEM.

Every patient has some fear of operation and suffers mentally more or less as a result of an unbalance in the equilibrium of the nervous system; this is particularly so during the hours immediately preceding the time set for the operation. The surgeon should take into consideration this mental suffering and unbalanced state of the nerve equilibrium. It is my belief that this mental anguish is a factor of some importance and to diminish it is not alone a refinement in the art of surgery, but reacts favorably on the patient, it lends a degree of comfort and creates a peaceful state of mind. A patient going to the anesthesia-room with a peaceful state of mind is better able to withstand the shock of an operation than one whose mind is greatly perturbed by a mental anguish, an anguish which is so great in the minds of some sensitively organized women as to amount to a horrible torture. The question may be asked "Can this mental anguish and disturbed nerve balance be obviated or lessened?" I believe we can mitigate this disturbed mental state by the administration of a hypodermic of hyoscine and morphine, two important cerebral sedatives. The preliminary administration of hyoscine and morphine hypodermically before anesthesia has been practised at the Woman's Hospital on the service of my chief Dr. P. F. Chambers since March 18, 1909. The method strongly recommends itself and has many valuable features in its favor. The full dose consists of $1/100$ of a grain of hyoscine and $1/4$ of a grain of morphine. A patient who has received a hypo of hyoscine and morphine one and one-half hours before she is taken to the anesthesia-room usually finds herself in a state of semi stupor. She is half conscious and is usually in a slight doze; her nerve tension is gone; she is calm; she is half asleep and has given up the fear of taking the anesthetic; she does not fret and worry, but is calm and composed. This is a pleasant feature in the administration of hyocine and morphine. She comes to the the anesthetic-room with a full pulse; flushed face and a peaceful state of mind. Hyoscine is distinctively a cerebrospinal seda-

tive. Her rate of respiration is, as a rule, depressed and may have dropped down to fourteen or fifteen per minute, or even lower. As a result of this slowness of respiration the anesthetic is taken rather slowly, and if the anesthetist is not accustomed to this mode of preparation, he will have some difficulty in knowing just at what stage of anesthesia his patient is in at the beginning of the administration of the anesthetic; a little observation and practice will soon teach him the necessary points and he will have no difficulty in knowing exactly the depth of the narcosis of his patient. I am anxious to make mention of this slowing of respiration in connection with hyoscine and morphine as it is considered an unfavorable feature in the administration of the drug. While it is apparently an unfavorable feature it is a difficulty that can be easily surmounted and the unfavorable part exists more in the imagination of an unwilling anesthetist. An observant anesthetist should have no difficulty in narcotizing his patient and bringing about complete relaxation.

The dryness of the throat, lips and mouth caused by the hyoscine I consider beneficial to the patient. The excessive secretion of mucous of the nasopharynx during anesthesia, with which the patient almost drowns herself is conspicuously absent in all anesthetics preceded by the administration of hyoscine. The allay of excessive mucous secretions during anesthesia I believe an important matter and deserves the careful consideration of the surgeon. The excessive mucous secretion of the fauces during anesthesia is doubtless the cause of a great deal of post-operative vomiting. Large quantities of mucous are swallowed by the patient which must react unfavorably on the gastrointestinal tract. There is no doubt in my mind that cases with acute gastritis occasionally seen after anesthesia are caused and augmented by excessive mucous secretion swallowed during the operation. Not alone does the gastrointestinal tract become filled with mucus excreted, but the respiratory tract also suffers from the excessive mucous secretion. Bronchial irritation, dyspnea, pain in chest, mucous râles are not infrequently to be observed after operation and doubtless excessive mucous secretion during anesthesia is a causative factor. "Ether pneumonia" is less frequently encountered now because the ether is administered with more circumspection, the administration of all anesthetics being now in more expert hands. Formerly when the patient was, so to say, "soaked in ether" the chemical irritation of the ether on the respiratory mucous membrane brought

on an inflammatory reaction. Not alone is hyoscine of value in preventing excessive mucous secretion during anesthesia, but, combined as it is, with morphine, it becomes a powerful sedative and there-by diminishes the quantity of ether necessary for maintaining a state of narcosis. Taking all things into consideration such as duration of operation, age and size of the patient, alcoholism, nervous and phlegmatic temperament, a smaller quantity of anesthetic is used when the narcosis is preceded by hyoscine and morphine, which in some cases amounts to a considerable quantity.

Attention is here, also, called to the postoperative recovery of patients who have had their narcosis preceded by the administration of hyoscine and morphine. It is our experience that the postoperative recovery of the patient the first three days after operation, is much smoother, less distressing and attended with less suffering. We have often observed that the patient sleeps quietly for a few hours after leaving the operating table, that they are less boisterous, less troublesome, and when they awaken they do not know about having been operated upon, the entire period of time during which the operation was done being a blank to the patient's mind. In a few instances the patients were convinced of their operation only when the incision was shown them.

In fact cholecystostomies can be performed under hyoscine and morphine anesthesia alone, without the use of other anesthetics. This, however, is only the case with those patients who have not become addicted to the use of narcotics during their long continued illnesses. In elderly patients with chololithiasis, the gall bladder can be incised and drained under the influence of hyoscine and morphine and, if necessary, an infiltration local anesthesia can be added along the line of incision. The patients hands should be held down as they have a tendency to carry the fingers into the operative field. Many of these old patients talk and murmur, but subsequently they do not remember anything about the operation.

POSTOPERATIVE VOMITING.

It is of interest to note the postoperative vomiting of patients, who have had hyoscine and morphine before anesthesia. One hundred and thirty-five cases were studied in reference to this point. These 135 cases were the first patients to receive the hyoscine and morphine before operation.

50 had no vomiting or nausea.
 23 vomited once.
 24 vomited twice.
 14 vomited three times.
 24 vomited more than three times.

135

In some of the cases where vomiting occurred more than four or five times; gastric lavage was called for in a large number of the cases. A few patients complained of nausea before the anesthetic was taken, but these cases vomitted very little after the operation. Nausea before operation following the administration of hyoscine was particularly the case with a patient who had eight anesthetics for plastic operation for extensive destruction of the bladder following pubeotomy. This patient, though nauseated before, complained of little nausea after the operation and as a rule she vomitted only once or twice. Thirty-eight per cent. with no vomiting is a favorable feature as far as post anesthetic vomiting is concerned. Not alone is there a marked reduction in the vomiting, but nausea is also lessened. The nausea and retching is more distressing to the patient than vomiting. If a patient vomits once or even twice after the anesthetic the degree of discomfort is not as great as if she retches and is greatly nauseated.

METHOD OF ADMINISTRATION.

The field of operation having been prepared and the final dressing applied, the patient is put to bed and dressed with the underwear and shirt to be worn during the operation. With the patient lying down one and one-half hours before operation she receives a hypodermic of 1/100 grains of hyoscine hydrobromide and 1/4 grain of morphine hydrobromide. The room is darkened and cleared of all relatives and visitors. Nothing further is done that may disturb the patient, but she is kept very quiet, so as to encourage a condition of drowsiness. In about an hour the patient falls into a light sleep; the pulse becomes full and slowed and the face flushed. When the time arrives for the administration of the anesthetic she is placed on a stretcher and rolled into the ether-room. The anesthesia is begun with gas followed by ether. The patients are calm; they do not struggle; have no fear of taking the anesthetic and many of

them do not even know afterward when the anesthesia was begun. The anesthetist should closely watch the patient as in many of them respiratory disturbance may occur if the anesthetic is crowded too much. However with a little practice and close observation, the anesthetist should have no trouble in bringing about complete relaxation of the patient.

I may briefly summarize the beneficial effects of the administration of hyoscine and morphine preliminary to anesthesia as follows:

First.—The fear of operation and anesthesia is abolished to a very marked degree. Instead of worry and fretfulness there is induced a state of calmness and mental peace. The patient is drowsy and somnolent when she goes to the ether-room. She avoids the necessary mental shock that occurs when the patient passes from consciousness to a condition of narcotized oblivion. This is a very important point for the surgeon to consider. It seems to me to be a refinement in the art of anesthesia to bridge the conscious mind to the state of narcosis, not with a suddenness of transition, such as occurs with inhalation anesthesia, but to interpose a species of sleep and mental calmness before the final narcotization. Were the preliminary administration of hyoscine and morphine to accomplish nothing more than this it would deserve the attention of the surgeon. Many patients awake from the anesthesia and have no recollection of having been to the ether-room.

Second.—The course of anesthesia is made less excitable. The muscular excitement; the twitching; the violent contortions of the patient are absent, and when present are mild in degree.

Third.—Excessive mucus secretion is absent; salivation is diminished; the fauces are dry; the pulmonary tract not being, so to say, drowned with mucous secretion, there is less likelihood of pulmonary complication. This is a second important feature in the administration of hyoscine and is most beneficial to the patient.

Fourth.—The amount of anesthetic used is materially lessened. The lessened amount of ether or chloroform used is of itself an advantage.

Fifth.—Nausea and vomiting is greatly reduced; 38 per cent. have no vomiting or nausea.

Sixth.—After the operation the patient sleeps on quietly for some hours and awakes with little recollection of the ordeal

through which she has passed. She avoids the acute and smarting pain incidental to the incision.

HYOSCINE.

Hyoscine was first discovered by Ladenburg who obtained the drug from the mother liquors in the manufacture of hyoscyamine. Some years later E. Schmidt discovered a substance in many solanaceous plants and named it Scopolamin. It was also found that hyoscine and scopolamin were identical. The physiological effects of hyoscine and scopolamin, even with the pure drugs, were so variable that it led to the belief that scopolamin and hyoscine were not identical. This is, however, disproved, and there is no doubt now that these two drugs are identical in every way. There is an optically active and inactive form of this drug; many fatal results were later reported with scopolamin, but this was on account of a misunderstanding of its pharmacologic action. Large doses act like atropin, but small therapeutic doses act differently. With small doses the vagus is stimulated and not depressed, which slows the pulse rate and vagus paralysis occurs only from large doses. Small doses abolish cerebral excitement. Small doses stimulate the vasomotor centers with a rise of blood pressure and some change in the pulse rate. Large doses cause a fall of blood pressure. A dose of 1/100 grains of hyoscine is a small dose, when one considers that Schneiderlin administered as much as 2.5 milligrams (1/25 gr.). In the 250 cases administered at the Woman's Hospital on the Service of my chief, Dr. Chambers, no ill effects of any kind have been noticed. The favorable features of the administration of the drug were very apparent. The calmness with which the patients come to the ether-room, the mental peace they exhibit in the trying moments of a patient's experience, is very striking and must react favorably on the mental mechanism of the patient. I believe the preliminary administration of hyoscine and morphine in small therapeutic doses before anesthesia is a safe and beneficial procedure and I can highly recommend it. The method adds greatly to the comfort of the patients in relieving them of nervous apprehension, of excessive mucous secretion and diminishing the postoperative vomiting to a considerable extent.

CHILDBIRTH IN ELDERLY PRIMIPARÆ.*

BY

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A SUBJECT of such practical importance as that of childbirth in the elderly primipara has, strange to say, found no attention at all in contemporary American literature. The text-books, too, either ignore the question or touch upon it with a few words only, with the sole exception of Edgar, who devotes a chapter to the subject in hand. Yet, we all were taught in medical school that childbirth in the elderly primipara is considerably more difficult than in the younger primipara and is to be dreaded both by patient and physician. In fact, the first question of the elderly parturient upon seeking our advice is almost always: "How far will my age play a detrimental part in my delivery?"

In view of the undisputable fact that the prevailing economic conditions militate against early marriage, the number of elderly parturients is bound to increase and the prognosis of their confinements attains the value of an eminently weighty problem.

The opinions as to what constitutes the term "elderly" primipara are not unanimous. While Leopold considers the twenty-eight year as the termination of youth, Schultze, von Winckel, and the majority of other authors regard thirty years as the turning-point. Ahlfeld names the thirty-second year, and Mangiagalli the thirty-fifth year as the beginning of "old" age as far as childbearing is concerned.

In accordance with the majority of the statistics available we will, then, define an "elderly" primipara as one who has her first child between the ages of thirty and forty-five years. First conception beyond forty-five years is so extremely rare as to have no practical importance and will therefore be left out of consideration. Late marriage is only one, though the most frequent, etiologic factor of late conception. Other causes, according to Edgar, are to be sought in part in uterine malpositions, cervical catarrh, tumors, congenital malformations, sexual frigidity, also impossibility of the husband to procreate.

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The course of pregnancy in the elderly primiparæ differs on the whole but little from that in younger women. Some authors assert that complications are more frequent in the elderly, yet, on critical analysis one does not find these statements sufficiently substantiated. Caillods points out that fibroids are found only in the older, in contradistinction to the younger primiparæ but we know quite well that the vast majority of fibroids give rise neither to disturbance during pregnancy nor later to dystocia. Abortion, albuminuria and other renal disorders are supposed to be relatively frequent (Webster, Dorland, Steinmann), yet, among 111 cases observed in Tarnier's Hospital in Paris only about 6 per cent. had albuminuria.

A number of authors assert that elderly primiparæ are particularly prone to have eclampsia but this view is not supported by the statistics from the hospital just mentioned where none of the 111 cases developed that complication. Hammerschlag found the prevalence of eclampsia in elderly primiparæ only insignificantly higher than in primiparous women in general, who, as is well recognized, show a greater predisposition to eclampsia than multiparous women.

Webster cites a contribution from DeKoninck who claims a greater frequency of ectopic gestation in elderly primiparæ but I have not been able to find this observation confirmed by others.

The most pronounced difference between the pregnancies of the older and younger primiparæ is the greater frequency of twins in the former. All statistics agree on this point. Weinberg in a very thorough statistical study found a marked influence of the age of the mother as an etiologic factor of dual gestation to exist in parts of Germany, France, Denmark, Russia and Hungary. Speaking of twins in general, he established statistically the fact that twins occur more frequently in proportion to the advancing age of the mother together with the increasing number of her deliveries.

Prinzing investigated the frequency of twins more particularly in primiparous women and gives the percentage in the following table:

Primiparæ below 20 years,	2.96 per cent. twins.
20 to 25 years,	3.54 per cent. twins.
25 to 30 years,	3.90 per cent. twins.
30 years and older,	4.14 per cent. twins.

That labor in the elderly primiparæ is more protracted and

severe than in younger women is a tradition firmly established both in medical and lay circles. The surprising ease and rapidity with which some elderly primiparæ bear children seems to contradict that tradition but should not influence us to draw too sweeping conclusions from occasional observations or general impressions. It behooves us to investigate objectively into the truth of the assertions made.

The duration of labor in all cases depends upon four components, namely:

First, the force of uterine contractions.

Second, resistance of soft and bony parts.

Third, the size of the child.

Fourth, position of the child.

If we apply this analysis to the labors of elderly primiparæ, we find feeble uterine contractions noted by a number of authors (Webster, Steinmann). Caillods claims that the energy of the uterus is reduced by age, therefore contractions are weaker. It is possible that the coexistence of fibroids may in some cases further weaken the insufficient power of the uterine contractions.

Resistance on the part of the bony pelvis would naturally interfere with the progress of labor. Edgar found 25 per cent. of pelvic deformities in his forty-seven cases of elderly primiparæ, and mention of contracted pelvis is made in other statistics as well.

Rigidity of the so-called soft parts has, of old, been considered the most potent factor in delaying the confinement. In particular the rigid cervix of the elderly primiparæ has been held responsible for an undue prolongation of the first stage of labor. This point, I believe, calls most clearly for a revision of our former opinions. Such rigidity is almost universally present in the primipara whatever her age might be and, as Edgar expressly points out, even in the multipara in premature labors. If the *vis a tergo* is only strong enough no cervix would remain "rigid," and since there is often a primary inertia in the elderly primipara as we have seen above, the resistance of the cervix finds a natural explanation. This view is fully supported by the conclusions reached by Edgar, Courgenon, Scheviakoff-Horochowska, and others.

The resistance offered by too rigid a perineum is, as a rule, too insignificant to prolong labor to any marked extent. Any perineum, rather than resist the on-coming head, will tear.

An unusually muscular perineum may, of course, delay the final expulsion of the child, particularly if the uterine contractions

are weak, but a simple episiotomy will quickly remove the obstacle.

If I may judge from occasional observations it seems to me that the venous congestion about the external genitals with its softening effects upon the tissues is rather well pronounced in the elderly.

Regarding the size of the child we have a number of interesting data at our disposal. Halban represents the views of most modern writers, that generally speaking the weight of the child increases proportionately to the advancing age of the mother and to the increasing number of her pregnancies.

Regarding now conditions in primiparous women in particular, Hecker has taken a large number of accurate measurements of the children with the following results:

Average weight of children in primiparæ of

15 to 29 years, 3181.17 grams.

30 to 44 years, 3191.31 grams.

Average length of children in primiparæ of

15 to 29 years, 50.49 centimeters.

30 to 44 years, 50.77 centimeters.

Wernich studying these findings more in detail observes that in primiparous women the weight of the child increases up to the forty-fourth year and the length of the child up to the fortieth year of the mother. Schroeder finally found that the great transverse diameter of the fetal head becomes disproportionately large when the age of the mother exceeds thirty-five.

In an abnormally large percentage of cases vicious presentations of the children are observed in elderly primiparæ. I dare not decide how often this anomaly is due to disproportion between the size of the head and pelvis but the fact remains that oblique and breech presentations are more common in the elderly (Edgar, Courgenon, Steinmann).

If we now consider these four components of any labor as a whole we can well understand why the duration of labor is longer in the elderly primipara than in the younger one. But if we look for average figures in literature we find a wide divergence of estimates ranging from sixteen hours (Courgenon) to sixteen and one-half hours (Edgar), eighteen hours (Kleinwachter), twenty and one-fourth hours (Scheviakoff), twenty-seven hours (Ahlfeld), twenty-one to twenty-nine hours (Hesselberg), and forty to forty-five hours (Webster).

The prevalence of one or more of the factors enumerated above sufficiently explains the occurrence of complications during labor and makes us understand why operative termination of the confinement was necessary in a rather large percentage of the cases.

Radzimovsky states that only in 70 per cent. did spontaneous delivery take place. Edgar's statistics are even more unfavorable. Of his forty-seven cases only 30 or 63.8 per cent., could be delivered spontaneously. The remaining 36.2 per cent. were delivered with forceps. Tarnier had to resort to forceps in 27 per cent. In Geneva (Scheviakoff), forceps were applied in 19.7 per cent. In addition, there were four vaginal and one abdominal Cesarean sections, three versions with extraction, and one embryotomy.

The frequent occurrence of lacerations of the perineum in elderly primiparæ is usually attributed to the rigidity of that structure but we must not lose sight of the fact that perineal lacerations will more frequently occur with obstetric operations.

This is very clearly shown in Democh's cases. She reviews 150 cases of childbirth in women of twenty-seven to thirty-five years of age and forty cases between the ages of thirty-five and forty-five. Forceps were applied in 11 per cent. of these cases. The perineum was lacerated in thirty-five cases or 18 per cent. In one-half of these, forceps had been used.

Statistics showing the frequency of perineal tears in primiparous women in general are given by Fasbender:

Primiparæ	Perineal lacerations
15 to 20 years	30.4 per cent.
21 to 25 years,	34.0 per cent.
26 to 30 years,	38.0 per cent.
more than 30 years,	50.0 per cent.

Whether these lacerations are not serious (Radzimovsky) or, on the contrary, heal less easily (Steinmann), will after all depend more upon the accoucheur than upon the age of the patient. One important point, however, has been brought out recently by Fetzer. He observes that women who bear their first child before the age of twenty, rarely develop prolapse of the genital organs. The later in life the first confinement occurs, the greater the liability to prolapse. The proportion increases slowly and evenly up to the twenty-seventh year. After that date the proportion rapidly increases with each year of the woman's age

at the time of her first pregnancy. The number of subsequent labors dose not, in his opinion, seem to play an important part.

It is clear that the maternal morbidity, if for no other reason, must be increased in proportion to the frequency of operations. Hesselberg had among 200 primiparæ over 30 years of age a febrile morbidity of 14.1 per cent.

Webster mentions that mental and physical exhaustion is very common, and Tuke claims that elderly primiparæ are more apt to have postpartum psychoses.

Postpartum hemorrhage occurred in 8 or 9 per cent. (Edgar, Courgenon) which is not very high considering the complications and number of operative interventions.

Edgar's maternal mortality was 0, that of Courgenon was less than 2 per cent. Of Radzimovsky's cases the maternal mortality in spontaneous births was 0, in instrumental births 3.75 per cent.

The children of elderly primiparæ require a separate consideration. To begin with, there is a marked tendency to produce more boys than girls. Generally speaking, the proportion of male to female newborn is the same all over the civilized world, namely, 106 boys to 100 girls. In the offspring of the elderly primiparæ, on the other hand, Hecker found 133 and Ahlfeld 137 boys to 100 girls.

It is a well-known fact that the initial excess of boys over girls is partly equalized by a high percentage of male still born. In elderly primiparæ the percentage of still born of both sexes is excessively high. Steinmann estimates 14.2 per cent. and Hecker 17.6 per cent. Steinmann concluded that three times more children die in elderly primiparæ than in the younger women. This high percentage undoubtedly depends to a large extent upon the frequency of operations and the skill of the operator. Cohnstein, writing in 1872, gives the amazing fetal mortality of 44.82 per cent. In all, 169 children died and of these 157 in consequence of some obstetric operation.

Improvement in operative methods and skill has brought about a most desirable change. Edgar had no fetal mortality in his forty-seven cases. Courgenon had less than 4 per cent. in 111 cases, while Radzimovsky noted a fetal mortality of about 9 per cent., although in her cases operative intervention had been necessary in 30 per cent.

If we now summarize all that has been said in the foregoing, we must conclude that the tradition handed down to us from

past generations of the many dangers of childbirth in the elderly primiparæ can no longer be maintained unreservedly.

There are not sufficient nor convincing proofs at our disposal which would show that pregnancy in the elderly primipara is more complicated than in the younger. Only one positive fact has been elicited, namely, that of a preponderance of twins in the offspring of the elderly primiparæ.

Protracted labor has of old been considered characteristic of first confinements of the elderly but this feature is by no means typical nor regular.

The rigidity of the cervix and perineum dreaded for so many years both in medical and lay circles seems to be but little more than a fable, and delay in the expulsion of the child appears in the light of our present knowledge to be due to feeble uterine contractions, excessive size of the head of the child, and vicious presentations. These three factors are also responsible for the fact that in a large percentage of the cases labor had to be terminated by operative means.

The necessity of such frequent operative intervention in its turn is the direct and only too natural cause of a greater morbidity and mortality not only in the mother but particularly in the children.

The signal advances made in obstetrics within the last decade have, happily, brought about considerable improvement in the conditions and the morbidity and mortality sheets, both maternal and fetal differ very little, if at all, in the elderly and younger primiparæ.

It is, therefore, with a feeling of hopeful assurance that we may take upon ourselves the care of an elderly primipara in childbirth and that we may allay the fears and anticipations of our patients and their families.

But I think we should go one step further and try to prevent any complication that may arise in labor. Considering that a feeble uterus will grow still more feeble as it becomes more stretched in the final weeks of pregnancy; considering, further, that the child's head will grow most rapidly in size and hardness in the last weeks of gestation; and recognizing, finally, that vicious presentations are most frequently due to disproportion between head and pelvis—taking all these points into consideration I believe that the logical conclusion must be to advocate the induction of premature labor at about the thirty-sixth week.

The indications for such procedure will become even more

forceful in all cases of elderly primiparæ in whom pelvimetry has shown reduced pelvic measurements, however slight they may be, in whom we also find a large child and, perchance, features indicating weakness of the uterus, such as fibroids.

It seems to me of importance to specify the method of inducing labor and I would think that the use of a Vorhees or Champetier des Ribes bag with a light weight attached would be preferable to other modes since we not only produce uterine contractions, but at the same time eliminate the cervix.

There still remains the problem of intensifying the expulsive powers of the uterus. If the most recent reports from abroad are to be confirmed we seem to have in the extract of the pituitary gland an excellent means at our disposal to produce and keep up strong and regular uterine contractions.

In the preparation of this paper I am deeply indebted for help and suggestions to Dr. George Gellhorn.

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BLOOD PRESSURE IN PREGNANCY.*

BY

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(With three Charts.)

THIS paper is a study of 200 cases collected during the last two years from different sources. The urine analyses were done in the well-equipped Grace Whitney-Hoff Research Laboratory of the Woman's Hospital. This research was undertaken in an attempt to show the normal or abnormal changes in blood pressure during pregnancy, parturition and the puerperium; also, if possible, to ascertain and elucidate any relationship between blood pressure and morbid conditions of the kidneys, liver or circulatory system.

Before beginning with this series of cases a number of instruments were tried out, namely, the Janeway, the Richlenhausen and the Tycos, since these instruments represent the three principal types of mercurial, torsion spring and aneroid. Mercurial instruments are difficult to carry about, and at a critical moment the mercury will be expelled. The Richlenhausen is very expensive, heavy, easily damaged, and is no better for taking diastolic pressure than the others. The Tycos was finally selected and used throughout with the cases, as it is very compact, and has a standard arm band or cuff, which is also most conveniently applied. It was occasionally compared with a mercurial instrument to check any change in adjustment. The differences in instruments, inaccuracies of the older ones and variations in sizes of cuffs, make it difficult to compare, with any degree of accuracy, the figures of various authors. For example, wide cuffs give lower figures. It cannot be said that the instruments are accurately calibrated as are thermometers, for the figures, when comparing the reading of one instrument with that of another, are relative only. Nevertheless, when using one instrument constantly the readings are accurate enough for all practical

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purposes and are quite satisfactory, the errors, if present, being of the same value in all cases. Errors affecting the readings that are more or less problematical are from keeping the cuff on too long and causing contraction of the biceps from the irritation of venous stasis, that due to variable muscular tone, voluntary contraction of the biceps, layers of fat, and so on. If, however, one is reasonably careful, these points are relatively unimportant.

As the pressure rises above the abscissa or normal line, each additional mm. of mercury has a greater value than its predecessor, as indicating, in the higher figures especially, considerable increase in work for the heart.

The method of taking the systolic pressure was the usual one. The cuff was applied snugly to the left arm at the heart level; air was injected with the bulb just sufficient to make the pulse disappear, and at the moment of return of the pulse the systolic pressure was read off. This method of reading the return of the pulse is now the procedure commonly employed, as in this way the pulse is more sharply defined than at the moment of its disappearance; that is, it is easier to feel just when the pulse returns after having been shut off than it is to tell exactly when you cease to feel it as it is being shut off. The left arm was used at a definite level, as there are some individuals who show a minor difference between the two arms. It is said (Janeway) that 10 mm. of mercury is the possible error between the cuff method of taking blood pressure and that of putting a canula in the carotid artery, as is done by physiologists when working upon dogs. As a routine the systolic pressure was made use of, since taking the diastolic pressure with a nonrecording instrument is very unsatisfactory, a fact observed by a number of authors; however, it can easily be done with the aid of a kymograph. The diastolic pressure, as read from the ordinary instrument, is the lowest pressure at which the oscillations of mercury (caused by the pulse) are still of maximal height.

The normal systolic pressure in nonpregnant individuals, measured with the Tycos instrument, was found to be quite variable, from 110 to 120 mm. of mercury, and to get accurate results the exact normal pressure should be decided upon in each individual in early pregnancy, so that variations in it may be intelligently followed throughout gestation.

In normal pregnancy I was unable to demonstrate that, as some observers have found, there is a typical rise of blood pressure beginning in the early months and progressing in height as preg-

nancy advances. On the contrary, this series of cases would lead one to the opinion that the normal circulatory system is fully capable of doing the increased work of gestation, without showing an increase of pressure. This point is borne out, at least to some extent, by the remarks of Edgar and the work of Stengel and Stanton, who showed that there was no hypertrophy of the left ventricle during pregnancy. In cases where there is a marked enlarging of the heart or increased pressure, lasting some time, of more than 10 to 20 mm. mercury, the circulatory system has been called upon by nature to compensate for the inefficiency of some other organ or organs, as passive congestion of the liver, etc. For example, if the kidneys are working under a lowered efficiency they must have more blood and at a higher pressure to eliminate the usual amount of solids and toxins. This variation of blood pressure to meet normal or abnormal conditions is brought about by a nervous mechanism similar to that of the heat nerve mechanism, that of the skin or the nervous mechanism of respiration. This nerve mechanism of blood pressure is wonderfully automatic and is governed by the vasomotors centers in the bulb, in association with the extrinsic and intrinsic heart nerve centers, vasoconstrictor and dilator nerves, etc. Various areas of this mechanism are reciprocally cooperative, *i.e.*, abdomen and brain.

In a word, moderate increases of pressure are conservative on the part of nature, but if long-continued, show that some abnormality exists.

To be of greater use in obstetrics, the pressure should be first taken in the early months of gestation, and a chart kept. Determine the exact normal pressure for the individual case, for there is quite a wide variation within normal limits, and then one has an excellent index of what the pressure should and should not do as pregnancy advances.

The relationship of the pressure to the condition of the urine was found to be quite constant. In a typically abnormal case an increase of blood pressure or nucleo-albumin (in the urine) would first appear, then as the pressure increased from 15 to 20 or more mm. of mercury, serum albumin and serum globulin would be found in the urine. The height of the pressure increases in about the same proportion as these two blood albumins increase in amount. Nucleo-albumin would occasionally appear in small amounts without an increase of tension. This albumin is considered a normal constituent of the urine by Faught and the first sign of kidney irritation by Simon. Nucleo-albumin can be made

to appear in animals by interefence of blood supply to the kidneys, and by some experts in urine analysis it is said to be the first proteid to appear. (Emerson.)

The charts shown give a good idea of how the percentage of serum albumin and serum globulin follow the high blood pressure, and also how these factors attend the gravity of the supervening condition. There may be a class of cases showing high pressure without the blood albumins, as in the so-called liver eclamptic states, but none of the cases studied presented such a condition. By a rise of pressure in this connection is meant that the pressure is above normal for some time, many hours or days. There are undoubtedly normal undulations of blood pressure, as for example, Traube Herine waves, lasting for short intervals where

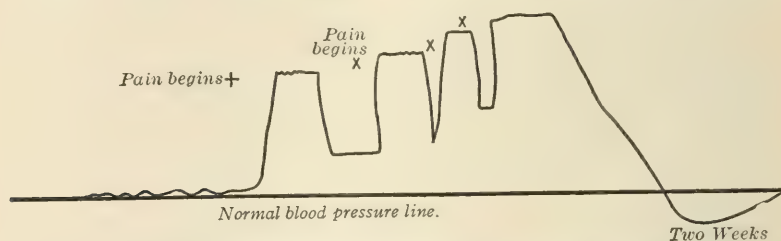


FIG. 1.—Illustrating the relationship between blood pressure and uterine contractions.

nothing abnormal can be found. This is especially noticeable in gestation and it is likely due to the general unstable condition of the nervous system in pregnancy, and influences on the vasomotor nervous system due to the close proximity of the growing uterus and the great vasomotor and vasoconstrictor nerves. Only one case of those studied presented high pressure and no other discoverable lesion.

During normal labor, as the pains begin to be frequent, the mean pressure is raised considerably above normal, and when a pain appears there is at first no additional response of elevation of pressure, but in a minute or two the pressure raises, and its height and duration are approximately the same as the uterine contraction. The pressure during a pain, which in some women is so high as to be dangerous, especially in conditions where the arteries are sclerosed or otherwise inelastic, would undoubtedly in certain cases call for treatment. The cause of this great increase of pressure during a pain is very interesting; it might be from the contraction of the uterine blood-vessels, or simply due

to the general muscular contraction. It has, however, occurred under anesthesia. None of these reasons seem logical. Were the cause so simple, the pressure would undoubtedly be better compensated for by its nervous mechanism. I believe that this rise of pressure during a pain is due to the stimulus of the contracting uterus upon the splanchnic nerves, which are the most important efferent vasomotor constrictor nerves in the body,

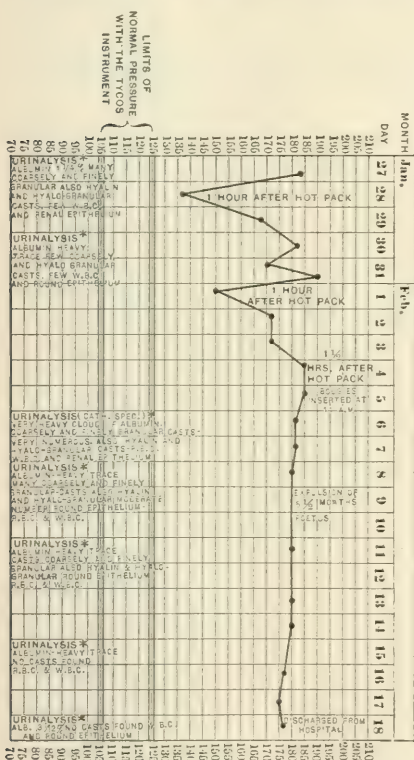


FIG. 2.

Showing the relation between serum albumin, serum globulin and blood pressure also the effect of the hot pack.

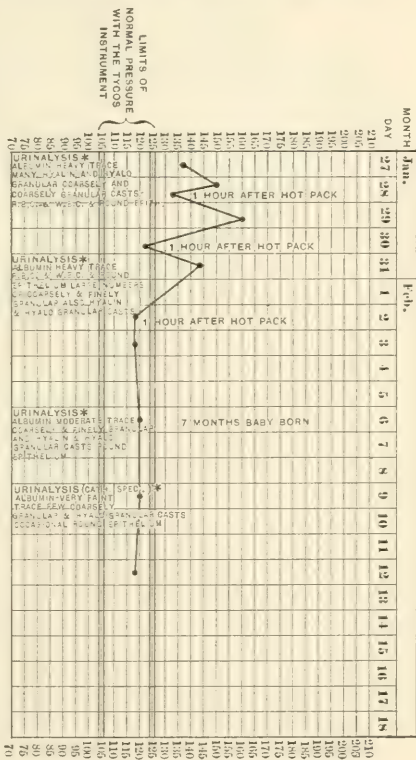


FIG. 3.

with the ramifications of which the uterus is so closely associated. The inter-association of the splanchnic and intercranial areas (Richert), that is, constriction of one causing dilatation of the other, is sometimes noticeable in women during labor, whose brain has, by nature, in this way, been mercifully dulled. An albumin occurring in the urine during parturition caused by the increased pressure and disappearing some time after the pains

have ceased, might be called the albumin of pressure, it is likely a nucleo-albumin.

After the child is delivered the pressure begins to fall immediately, or within a few minutes; it may continue in its downward trend for twelve or more hours, then it begins to return to normal, irregularly, and is much influenced by sitting up, manipulations in the uterus, mild exertions, and to some extent by eating. Usually it regains the normal in about two weeks. Cases which do not present this normal fall should be looked upon suspiciously, especially if the blood albumins are found in the urine.

Premature birth does not cause so large nor so continuous a rise of pressure as a child at term.

The few cases of compensated murmurs seen, while leading to a greater tendency to irregularities in pressure, did not present any other differences from nonpregnant women. The same might be said about enlargement of the thyroid gland, though the frequency of this latter condition in pregnancy would suggest the advisability of further study of this feature. Professor Hirst, of Philadelphia, mentioned casually that he could frequently diagnose past pregnancies by enlarged thyroids. Accentuated second sound of the heart was frequently noticed with high pressure serum albumin, serum globulin and casts.

Excessive blood pressure during eclampsia is very characteristic of this disease. The pressure is maintained at a high level, 150, 180, 200, 300 mm. mercury, oscillating a little from time to time, increasing during a convulsion or directly afterward. In kidney eclampsia the pressure (in the cases observed), was usually in proportion to the amount of serum albumin and serum globulin excreted. The amount of urine, however, did not increase with the pressure. The normal law is that the amount of urine varies directly as the rapidity of blood flowing.

Nothing of interest could be found in regard to the urea output, although it was carefully estimated, other observers having noticed this same point in reference to uremia. From the cases of eclampsia observed I presume that a certain amount of hypertension is desirable, as only in this way can a sufficient amount of blood be driven through the constricted capillaries of the kidneys. It would seem extremely likely that an oncoming case of eclampsia could be foretold or prevented by the aid of a blood pressure chart, and that it is a most useful adjunct to urine analysis cannot be doubted.

Professor Hirst, of Philadelphia, says that albumin shows in

only four-fifths of the cases of eclampsia. As the nervous mechanism of blood pressure reacts to other toxins than those which are concerned in the loss of the blood albumins, no doubt many of the remaining one-fifth of cases could be anticipated by changes in blood pressure or the finding of some substances from the liver in the urine in that type of cases. (This substance was carefully sought for but, as there were no suitable cases, unsuccessfully.)

The methods suggested for relieving excessive pressure are, rupture of the membranes, emptying of the uterus, the usual drugs for that purpose and the hot pack which, as may be seen by the illustrations, is often efficacious. That albumin is in some of these cases only an index of the toxins present, or shows an interference with the internal secretion of the kidney, is illustrated by the fact that at autopsy there may be no structural changes in these organs. A few individual cases might be of interest.

1. A case of *syphilis* in pregnancy, with high pressure, 170 mm. of mercury, serum albumin and semi-globulin in the urine; all symptoms improved and blood pressure was lowered under treatment with "606" and the usual methods.

2. A case, seen by the courtesy of Dr. Huson, of *albuminuric retinitis*, with moderately high pressure; sight and blood pressure improved to recovery after emptying the uterus.

3. Under *septic infection* the few cases seen seem to have no special relation to the blood pressure except to show asthenic conditions somewhat before one would notice them from the pulse and general aspect.

4. Under the *circulatory* cases was one of presystolic thrill at apex, mitral stenosis, blood albumins being present in the urine; as the blood pressure decreased the thrill and albumins disappeared.

CONCLUSIONS.

1. A more careful urine analysis should be made when any albumin is found in the urine. Regard with suspicion the report of a "trace of albumin" from the average analyst, as I have frequently found this "trace" to be (what I would call) a large amount. Separate the albumins in grave cases and see if there is nucleo-albumin, or serum-albumin and serum globulin. For a quantitative test use Esbach's albuminometer, as it is just as easy to manipulate as the Hoismoscope and is a much better guess at the amount of albumin.

2. Patients after delivery or eclampsia, with high pressure, should be kept under observation. Notice if the pressure falls normally after labor.

3. In cases which present high pressure with cerebral symptoms, serum albumin and serum globulin, consider emptying the uterus before convulsions appear. (Revised from Vogeler.)

4. Great hypertension like hyperpyrexia may require treatment in itself. All patients with high pressure should be watched.

5. In women where circulatory conditions are not normal the pressure should occasionally be taken during a pain.

6. It is likely one could foretell or prevent eclampsia by the guidance of a blood pressure chart.

7. Make use of the fact, and do it early, that the skin can do a part of the work of the kidneys; that is, it is known to eliminate urea and albumins and, we must believe, many toxins.

8. A blood pressure chart would be of service in foretelling shock and concealed hemorrhage, from the association of these conditions with the vasomotor system. A woman can bleed to death in her own abdominal vessels.

9. Nucleo-albumin is not as dangerous a constituent of the urine as serum albumin and serum globulin.

10. You can gauge the gravity of a case by the height of the pressure, and the amount of serum albumin and serum globulin present.

The writer desires to thank Dr. Manton for suggesting and making this work possible, and Dr. Wm. A. Willson of the Crittenden Hospital. Dr. Windsor, Dr. Miller and other internes of the Woman's Hospital, and Miss Galbraith, laboratory assistant.

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THREE CASES OF ANTEPARTUM ECLAMPSIA WITH CONSERVATIVE TREATMENT.

BY

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It is most unfortunate for the student of eclampsia that there is no agreement among authorities as to the etiology and treatment of this dread of all obstetricians.

The physician who is called upon to meet the emergency of a puerperal convulsion is compelled to choose a treatment that is at once condemned by a large number of eminent and recognized authorities. He knows that in the event of a fatal outcome to child, mother or both, he will meet the criticism of a large number of intelligent physicians. He will spend many uneasy hours weighing the pros and cons for various treatments for any of which he can find high authority, and, what is most disquieting, equal condemnation.

Hamlet's "To be or not to be" is a mere primary psychological exercise compared to what the obstetrician suffers, for the unhappy Dane had only his own future to consider.

The etiology of puerperal intoxications is equally as obscure and unsettled as the treatment. We are invited to take our choice of a great variety of theories as to their source and causation, all of which are unsatisfactory, and nonadequate or convincing.

From constipation to proliferation of the syncytium; from disordered liver to failure of the parathyroid, we have a wide range of theories. There is a wide difference between a disordered liver due to faulty metabolism and a toxemia due to production of an excess of syncytial enzymes. If in despair we turn from the intoxication theories to other and newer guesses, we may choose between an excess of chlorides or a deficiency of calcium in the pregnant woman. He who judiciously weighs the evidence for and against the various theories must conclude that we have no adequate explanation of the phenomena of eclampsia.

That the ovum or fetus is the primary cause of the intoxication is self-evident. That albuminuria and eclampsia are ten-fold more abundant in twin pregnancies than in single, emphasizes the fetal origin of the phenomena. That eclampsia is rare in

hydatid mole and other syncytial growths is not consistent with the syncytial theory. That postpartum eclampsia occurs in 21 per cent. of the cases does not help us in theory or practice. That the child may be born of an intrapartum attack of the disease in a state of maceration that shows it has been dead for some time, does not make the theory of fetal and placental products any more satisfactory.

I shall not add to the confusion by endorsing any of the prevailing theories, or confound confusion by offering one of my own. Whatever our theory, treat the disease we must. At the outset we are met by two diametrically opposed methods of treatment. We find radical condemnation of the other's method by leaders of the opposing camps. Bumm and Jellet in Europe advise immediate evacuation of the uterus by accouchement forcé or vaginal Cesarean section, whether the spasm occur during pregnancy or during labor. Herman of London declares that termination of pregnancy does not benefit the patient and supports the assertion by an analysis of 2,000 cases in different lying-in hospitals. He asserts that if the patient is forcefully delivered the danger incident to quick delivery is added to those of eclampsia, and if Cesarean section is adopted we are not certain of stopping the fits. Zinke declares that to advocate the prompt evacuation of the uterus is not good teaching, and he supports the assertion by an analysis of ninety cases in his own practice. Hirst is the only American writer of a text-book who does not advocate immediate evacuation of the uterus. After reviewing 260 cases of his own in which both plans were tried, he asserts that any form of accouchement forcé adds to the risk and increases the mortality.

In the last few years there have been numerous reports of the successful termination of pregnancy in eclampsia without resort to force. There is a growing conservatism despite the dogmatic insistence on forceful delivery, and an increasing confidence in nature's method when eliminative methods are substituted for radical procedures. There is a still larger group who occupy a middle ground and who are not prepared to abandon or wholly condemn the quick delivery of the mother, but do not resort to it until the conservative treatment fails to bring about the desired results—the amelioration of the urgent symptoms.

Fortunately, whatever the cause, pathology or treatment, we find agreement in prophylaxis as most important.

We do not do our whole duty to our patient by the routine

examination of the urine for albumin. Edema, constipation, alterations in blood pressure, disturbances in vision and persistent headache call for attention to diet and elimination. Persistent headache or rise in blood pressure call for active catharsis, rest and a milk diet. Disturbance in vision is an ominous symptom and calls for active catharsis and sweating by the cabinet or hot pack. Diuretics are ineffective if not injurious until the vicarious action of the skin and bowels have relieved the kidneys of their overload.

There is considerable evidence bearing upon the action of the parathyroid secretion upon the toxic substances causing eclampsia. It is asserted that the gland produces an antibody that destroys or counteracts the effect of toxins incident to the pregnant state. With this indication parathyroid is given as a prophylactic in evidence of intoxication.

Another of the recent theories is that of the abstraction of the calcium salts by the growing fetus. This is the supposed cause of the fatty infiltration and degeneration of the liver cells, an almost constant lesion in eclampsia. The administration of calcium salts or a diet rich in them of course meets the indication. The third of recent theories is that of the retention of the chlorides, mainly sodium chloride. This of course calls for a salt-free diet and the substitution of a sugar water proctoclysis in treatment instead of the usual normal salt.

The above are fortunately simple methods, and can do no harm and may meet possible indications, in a disease where the etiology is obscure.

Recent studies indicate that the time honored administration of chloroform in convulsions only adds fuel to the flame. The cessation of the spasms during anesthesia does not indicate amelioration of the condition. Liver lesions of chloroform poisoning are identical with those of eclampsia. Its use should be restricted to anesthesia when for any reason surgical measures are undertaken.

The eclamptic seizure demands the active and energetic efforts of the attendant to promote prompt and effective elimination; hot packs; the sweat cabinet; hypodermoclysis, if there be no edema of the lungs; proctoclysis by the Murphy method; catharsis by croton oil, or salts if the patient is able to swallow; morphine in one-quarter grain doses repeated every thirty minutes until the patient is in a deep sleep. There is much prejudice against the use of morphia, despite the magical results in these

convulsions. Osler says that in the delirium of uremia morphia is indispensable. Veit of Bonn, LaHarpe of Dublin, and Herman of London declare that since the treatment by morphia was adopted the mortality is less than half of cases treated by other methods.

Chloral hydrate by the rectum following the use of morphia has given excellent results in my practice. The dose is 20 grains in one-half pint of warm milk, repeated as often as is necessary to keep the patient asleep. If the patient is in labor, rupturing the membranes according to the methods of Hirst and Williams gives marked relief by lowering the blood pressure.

The writer's object is to give the results in three cases of antepartum eclampsia where the expectant or noninterference method was adopted. All were primipara, and but one gave any indication of albuminuria until the onset of the spasms. In none of the cases was there any treatment until the onset of the first convulsions. After treatment there was a complete cessation of the convulsions and a rapid improvement of all the urgent symptoms. In two of the cases the mothers gave birth to living children, while none gave any evidence of symptoms either during or after delivery.

CASE I.—Mrs. L.; referred by Dr. Dodds; age, twenty-six; pregnant eight months. Patient was seized with nausea, became blind, went into a convulsion that was succeeded by deep coma. She was at once sent to the hospital where vigorous treatment was started; chloral by the rectum, morphia by the hypodermic, hot packs, croton oil and salines for active catharsis. By morning the condition was much improved. Patient had no more convulsions; vision improved; albumin persisted for a great while, but showed a daily improvement. At the time of the attack the urine by catheter was scant and solid in the test-tube by the heat test. Five weeks after the convulsion she was delivered of a living boy after an uneventful but disquieting labor. She made an uneventful recovery, but has never been free from occasional traces of nephritis.

CASE II.—Mrs. J.; age twenty-four; primipara; pregnant seven months. Except for considerable edema the patient had not suffered more than from the usual annoyances of pregnancy. Patient was seized with sudden blindness, and before a physician could reach her she was taken with convulsions, three of which she had before she was taken to the hospital. The treatment in this case was a duplicate of Case I. She left the hospital in two weeks much improved. Examination showed the child was alive. She was placed on a milk diet with instructions to keep up free catharsis with salines. Becoming alarmed because of the cessation of fetal movements, she returned to the hospital

for the impending premature labor. Vaginal examination showed the head well down in the pelvis; the cranial bones were easily compressed. The heart could not be heard, and concluding that the child was dead, labor was induced by introducing solid rubber bougies into the uterus. Child born dead after an easy labor; mother now quite well.

CASE III.—Mrs. K.; patient of Dr. Ensminger; primipara; pregnant about eight months, according to her menstrual history. The height of the uterus was consistent with a seven months' gestation. Frequent examinations previous to the attack showed the urine free from albumin. Eclamptic September 24, when she was immediately sent to the hospital. Urine by catheter scant and solid by heat test. When seen by the writer she had suffered from a number of convulsions and was in deep coma. Face, hands and limbs edematous; pulse rapid but unusually compressible for eclampsia. Treatment same as in Cases I and II. The beautiful action of chloral and milk diet was well demonstrated in this case. The severe headaches were always controlled by 20 grains by rectum, repeated if there was not a prompt quiet sleep. Proctoclysis was persistently followed until there was marked increase in the urinary output, and an improvement in the vision which was almost completely gone upon her return to consciousness. She left the hospital in two weeks much improved and with the child still living. She had very little medication excepting a free use of salines, distilled water and a strict milk diet.

On the nineteenth of October she was alarmed by an escape of amniotic water, and went to the hospital, where she went into labor and gave birth to a living vigorous girl weighing 3 pounds 8 ounces. At the onset of labor she was given 20 grains chloral, and when pains became severe was given one-quarter grain morphia by hypodermic. Upon readmission to the hospital the urine by catheter contained 22 per cent. albumin. Two days before it contained 11 per cent. in a twenty-four hour specimen. Twenty-four hours after delivery it had dropped to 4 per cent., the lowest since the initial convulsion. Mother and babe are doing well.

I am aware that three cases do not offer much scientific basis for final conclusions, but when taken in connection with many other such reported I am convinced that the best thing was done. I am confident that rapid or premature emptying the uterus in either of the three would have added to the shock and prolonged the attack.

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THE RELATION OF VAGINAL HYSTEROTOMY TO THE
PROBLEM OF RAPID VAGINAL DELIVERY.*

BY

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THE tendency of obstetric treatment has always been conservative. The minimum amount of interference with the processes of nature has been the underlying principle of all teaching. The unfortunate results of the early operators impressed the minds of the profession and laity alike, with so great a dread of surgical intervention that the progress of obstetric practice has been unduly retarded, until it stands to-day the least advanced of all the special departments of surgery.

Within the last decade, however, a feeling of dissatisfaction with the older methods of handling many of the complications of pregnancy has manifested itself, and there is a growing tendency to meet by radical procedures emergencies that were formerly temporized with or treated by timid and inefficient means.

Among the obstetric problems that are now being submitted to the test of surgery is one that we are frequently called upon to solve, rapid delivery by the vaginal route before the end of the first stage of labor. There are many complications arising during pregnancy which make it desirable to empty the uterus as promptly as is consistent with the mother's safety. Pernicious vomiting, toxemia of pregnancy, eclampsia, antepartum hemorrhage, and threatened heart failure in cardiac decompensation form a group of serious conditions that endanger the life of the pregnant woman.

It is not my purpose at this time to discuss the relative merits of the many plans of treatment in use for the conditions named. I shall assume that when these emergencies arise it is proper to empty the uterus, and that delay in doing so affects the prognosis adversely.

Let us take for example eclampsia, the most frequent indication for rapid delivery. All authorities agree that the prognosis in this condition improves with the termination of pregnancy. Furthermore, all are unanimous in recommending that labor be hastened, when it is present, by the extraction of the fetus, as

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soon as the condition of the cervix will permit of easy delivery. The rock upon which the wave of discussion breaks is the undilated cervix. Shall we open it by force, or shall we wait until the obstacle of the resistant muscle fibers has been removed by natural processes? The conservative element of the profession elect the latter course. They have found the hazard of forcible delivery greater than the risk of the condition for which they would deliver, and they recognize in the closed cervix a barrier which it is dangerous for them to cross. This lesson has been impressed upon our minds by bitter experience with the popular methods of dealing with the closed cervix.

There are two plans of approaching the problem of cervical resistance. The first may be designated as the *obstetrical plan*, the second, as the *surgical plan*. The underlying principle of the obstetrical plan is an attempt to imitate the processes of nature, to paralyze the circular fibers of the cervix by manual or mechanical pressure, and to open the canal by forcible dilatation. In the application of this principle, three methods have been developed, manual, instrumental and bag dilatation. A brief glance at each will give a better understanding of their uses and limitations.

Manual Dilatation.—The method of hastening delivery which is most commonly practised is to stretch the sphincter muscle of the uterus with the fingers after the method of Harris or of Edgar. This plan presupposes a cervix prepared for dilatation by the retraction of the circular fibers and the thinning of the lower uterine segment, and an opening through which two or more fingers may be inserted. It is practical, therefore, only in cases which have been in labor long enough to obliterate the cervix and open the external os. When these conditions do not obtain the operation is difficult, prolonged, and accompanied by considerable risk of injury (to the cervix) or it may be altogether impossible.

Instrumental Dilatation or Accouchment Force.—This is a more radical procedure, and is designed to meet the requirements of cases in which it is desirable to empty the uterus before the labor has begun, or before the condition of the cervix will permit of manual dilatation. This plan is carried out in one of two ways; the branched dilator is used to secure enough room to insert two fingers and then the dilatation is finished manually. Or, the dilatation is carried to completion by an instrument specially designed for the purpose, the Bossi dilator. With this powerful

instrument great force is developed, and the cervix is stretched, or torn open when it is too rigid to dilate. After sufficient room has been obtained, the forceps are applied or version is performed and the fetus dragged through the imperfectly paralyzed cervix, completing the dilatation or the laceration as the case may be.

This procedure has caused great injury to the pelvic structures, has been very severely condemned, and has been generally discarded and justly so, for it is unscientific in conception, brutal in execution, and crippling in results. Planned as an imitation of the natural phenomena of labor, it disregards the most important principle of Nature's mechanism by trying to dilate the cervix before it is ready for dilatation, and by attempting with clumsy and inefficient means to cut down the time of the procedure from many hours to a fraction of an hour. For Nature herself, with her perfect mechanism, can accomplish the dilatation of the cervix with safety to the integrity of the tissues only, when she consumes much time in the process.

Bag Dilatation.—The unfortunate results of the method just described suggested a more exact imitation of Nature's mechanism for dilating the cervix, and led to the use of rubber bags filled with fluid and designed to act like the natural bag of waters. There are two types of bag in use. They may be designated as passive and as active dilators. To the former class belongs the Voorhees. This bag acts like a wedge, hastening the opening of the cervix when there are pains behind to drive it, but ineffective without uterine contractions. Its presence in the cervix does not always excite pains; hence it is of little use in rapid delivery. To the second class belong the Pomeroy bag, which is the perfect type of hydrostatic dilator. It is not dependent upon uterine pains, but is active by its own mechanism. It obtains its power from the pressure of the water which is forced into its compartments by a piston syringe. This pressure can be regulated at the will of the operator. In intelligent hands it is rapid, efficient, and safe in the class of cases to which the principle of dilatation can properly be applied. It must be operated with care, however, as it is a powerful dilator and deep lacerations of the cervix or even rupture of the uterus may attend its careless use. In this apparatus is developed the highest type of artificial dilatation of the cervix. But even this instrument, so perfectly designed to imitate the process by which nature opens the cervix, will not do the impossible. The uneffaced cervix of

the middle months of pregnancy cannot be dilated by it with the safety and despatch that are essential elements of a successful operation for the termination of pregnancy in the conditions under discussion. Therefore, the question arises, can the principle of dilatation be applied to all cases? Nature applies it only after preparing the cervix for dilatation by prolonged pressure of the presenting part which causes edema and softening of the tissue and by retraction of the circular fibres of the lower uterine segment which reduces the thickness and resistance of the cervix. To be accurately imitative, therefore, one should apply the first or obstetric method of approaching the problem of the obstructing cervix only to those cases where labor has begun and the cervix is obliterated, the muscle soft and relaxing, and the external os dilating.

The surgical plan of treatment of the closed cervix is diametrically opposed in principle to the methods just described.

Duhrssen's operation, vaginal cesarean section, or vaginal hysterotomy.

Duhrssen approached the problem in a different way. He believed it safer to incise the unstretched muscle fibers in the place where the incision would do the least harm and restore the parts to their normal condition by accurate suturing, rather than risk the possibility of deep and uncontrollable lacerations that not infrequently extend into the uterus, the bladder, the broad ligament or the peritoneal cavity, endangering the life or at least jeopardizing the health of the patient. He claims for his operation that it subjects the patient to less traumatism than the dilating operations, and that it minimizes the risk of sepsis, because a cleanly cut tissue that can be sutured is less likely to become infected than a bruised and lacerated one. Furthermore, there is less risk of direct infection since the hands do not have to be introduced into the vagina so frequently as in performing manual dilation. Again, this operation makes it possible to deliver easily and rapidly, the very class of cases where the other operation fails, that is, in the middle months of pregnancy, when the cervix is unprepared for dilatation. Another important argument in its favor is that it reduces the time of the operation, the amount of ether, and therefore the shock.

The operation is an easy one for men accustomed to vaginal surgery. It is not adapted to the use of the general practitioner more than is any other highly specialized operation. It is not without risk, as the bladder has been injured, the wall of the

uterus torn, and the peritoneal cavity opened by a few operators. The number of accidents reported have been unusually few, however, for a new operation.

Realizing the limitations of the dilating methods of dealing with the obstructing cervix in cases of eclampsia and toxemia of pregnancy, I formerly accepted the dictum of the conservative school and treated by palliative measures the cases in which the condition of the cervix did not permit easy delivery. A series of unfortunate results made me dissatisfied with this plan and I determined to try the Dührssen operation. During the past three years I have performed it on nine cases, all of which demanded prompt delivery, and all of them presenting conditions of the cervix that contra-indicated dilatation. There were six cases of eclampsia, two of antepartum hemorrhage, one of pernicious vomiting of pregnancy. The period of gestation ranged from five to eight months.

Of my six cases of eclampsia, three were operated on early, having had from one to six convulsions and no medical treatment; three were operated on late, having had medical treatment until their cases were deemed hopeless, and innumerable convulsions. Of the cases operated on early all recovered; of the late cases one recovered and two died, one of these being moribund on admission.

My cases of antepartum hemorrhage presented no operative difficulties. One was for lateral placenta previa, one for accidental hemorrhage. Both were in the sixth month of pregnancy. Both had rigid undilated cervices. In both the operation was easy, not attended by unusual hemorrhage, the recovery uneventful, the union primary and perfect.

My case of pernicious vomiting was hopeless on admission. Her operation was truly a last resort operation. The uterus was emptied and the incisions sutured in twenty minutes. She left the table little if any worse than before. But she died of the toxemia on the second day following.

Of the nine cases five were multiparæ, four were primiparæ. The multiparæ presented no operative difficulties. All recovered with primary union, and without pelvic complications, except one, the fatal case of pernicious vomiting. In two of the primiparæ difficulty was encountered in exposing the cervix. In both the perineum had to be incised and the vagina dilated. In my second case the cervix could not be brought down far enough to give good exposure for the uterine incisions. An

unusual amount of hemorrhage was encountered, and the after-coming head was delayed by the soft parts. As this case illustrates the contra-indications and the difficulties of the operation it will be reported in full below. In all my cases that recovered union was primary except in the first, and she got an excellent result by secondary union. In general terms it may be said that the operation is easiest in multiparæ early in pregnancy; that the more rigid the perineum, the smaller the vagina, and the larger the fetus, the more difficult is the operation.

I have selected the following cases to report because they illustrate some of the points which I have tried to emphasize.

The first represents the folly of attempting to dilate an undilatable cervix. The second shows the type of cases to which the vaginal hysterotomy is especially adapted, the technic which I consider best, and the results that will usually follow the early operation in eclampsia. The third illustrates the difficulties of the operation, the contra-indications to it, and the outcome that is to be expected from a late operation on a neglected case.

The following case illustrates the contra-indications to, and the difficulties of applying the dilating methods to cases of eclampsia before obliteration of the cervix has taken place.

CASE I.—M. N., aged twenty-nine; admitted to Low Maternity in the seventh month of her first pregnancy, on December 7, 1905. She had been sick for a month with headache, edema, and vomiting. She had a convulsion the morning before admission.

Local Condition on Admission.—Uterus enlarged to the size of a six months' pregnancy. Perineum sound; vagina small; cervix rigid; external os closed; canal not obliterated; no pains present.

On day after admission patient had a second convulsion in spite of treatment, and it was decided to deliver without further delay.

Under anesthesia the cervix was dilated with steel dilators until a number one Pomeroy bag could be inserted. The dilatation was continued with the bag. With each expulsion of the bag the cervix closed down to one finger. After ninety minutes the attempt to dilate was given up, and a Voorhees bag was inserted, the vagina packed and the patient put to bed. On the following day, a second attempt was made. When the pack and bag were withdrawn the cervix was still rigid and the os admitted only one finger. The second effort met with the same result as the first, and was again abandoned after the membranes had been ruptured and a Voorhees bag inserted and the vagina packed.

On the third day after admission pains set in and the patient delivered herself. Her examination on discharge showed a moderate laceration of the perineum, healed; a deep laceration

on the right side of the cervix extending into the vaginal fornix; a thickened and tender right broad ligament.

Contrast the difficulty met with in emptying the uterus in this case, the amount of anesthetic, and the risk of infection from repeated introduction of the hands into the vagina, and the pelvic injury sustained, with the following case.

ECLAMPSIA, VAGINAL HYSTEROTOMY.

CASE II.—K. H., age thirty-five, admitted to Low Maternity on September 11, 1911, in the eighth month of the fifth pregnancy. Personal history normal. Parturient history; four full term children by normal labors; one miscarriage at six months. Cause unknown. Previous pregnancies normal. Present pregnancy: Last menstruation on January 30, 1911. Has suffered from the beginning with severe headaches, nervousness, and epigastric pain. Was seized with convulsions at 11 A. M., on day of admission. Had second convulsion in the ambulance, and third soon after arriving at the hospital.

Condition on Admission.—Temperature 101, pulse 135, respirations 26, blood pressure, 150. Semiconscious, restless, muscular twitching, color good; tongue lacerated; chest, negative; abdomen, fundus two inches above umbilicus. Presentation, cephalic.

Perineum, old lacerations. Cervix, slight bilateral lacerations; external os admits one finger. Canal 1 inch long. Internal os admits one finger.

Urine, amber; acid, 1011; albumin, sugar, casts.

Blood count: 12,000 white cells, 75 per cent. polymorphonuclears.

Vaginal Hysterotomy section. Technic: cervix exposed by retractors, pulled down by tenaculum, silk traction sutures introduced. A number three Voorhees bag passed through the cervix, filled with water and used to test the rigidity of the cervix and as a tractor and guide.

An anterior incision was made in the vaginal vault and the bladder separated from the uterus, and vaginal wall. The vaginal wall was then incised sagittally. The bladder held out of the way with a retractor, and the uterus incised until the bag slipped out. This was accomplished easily as there was very little bleeding and no difficulty in exposing the parts to be incised. A podalic version was performed. The placenta extracted manually; the uterus irrigated and the wound sutured with chromic gut. No drainage. Time of operation, thirty minutes. The baby weighed two pounds and two ounces. It lived for eight days, dying of prematurity.

The patient made a rapid and uneventful recovery except for a slight disturbance of mentality. She had periods of irrationality at intervals for several days after delivery, evidently of toxic origin. Her mind cleared up at the end of the first week. She was out of bed on the twelfth day; discharged on the fourteenth day.

Condition on discharge: Cervix, incisions healed; primary union; apposition perfect. Uterus, small; fundus normal position, no exudate. Bladder, normal position; function normal. General condition good.

Comment.—The use of a bag in the cervix facilitated the operation by making it less bloody and by aiding in bringing down the cervix. If the bag approximates the size of the baby's head, the incision will be sufficient for delivery when the bag slips out easily.

ECLAMPSIA, VAGINAL HYSTEROTOMY.

This case illustrates the difficulties and contraindications of the operation.

CASE III.—Mrs. T., a primipara, aged about thirty, in the ninth month of pregnancy was admitted to my service at the Bushwick Hospital on January 2, 1910. She had been having convulsions all day, unabated by medical treatment. When admitted to the hospital she was in deep coma. Her pulse was rapid and weak, her respiration stertorous, her color cyanotic. There were many râles all over the chest. The fundus of the uterus was 1 inch below the ensiform. The position was cephalic. The fetal heart was very rapid and weak. There were no labor pains present. The perineum was sound and firm. The cervix was not obliterated. The canal was closed.

Number of convulsions before admission unknown. Her convulsions continued at frequent intervals after admission. Her condition seemed desperate. An operation was decided upon as offering the only chance. A vaginal Cesarean was performed with great difficulty. The perineum was rigid and had to be incised. The vagina was small. The cervix could not be pulled down. The hemorrhage was profuse. The incisions in the cervix were successfully made, but after version the head was delayed by the undilated soft parts and the child, already very feeble, died before it could be delivered. Suture of the incisions with chromic gut was easily done as the cervix could be pulled down after the delivery of the placenta. The patient left the table in a bad condition and died an hour after the operation.

Comment.—If any operation was indicated in this case it was not a vaginal Cesarean. The rigid condition of the perineum and vagina, the high position of the head and the impossibility of pulling down the cervix before making the incisions, plainly contraindicated the operation. An abdominal Cesarean would have given the child a better chance, but would not have affected the results so far as the mother was concerned, as she was practically moribund before the operation was attempted. Operative delivery on dying cases should be discountenanced, as it does

not affect the prognosis and it helps to create a false conception of high operative mortality in the treatment of eclampsia.

GENERAL CONCLUSIONS.

When emergencies arise in the practice of obstetrics demanding the termination of pregnancy before the end of the first stage of labor, the plan of dealing with the obstructing cervix should be chosen to meet the indications presented by each case. The obstetrical plan is suited to the cases already in labor, where the cervix is obliterated, the lower uterine segment thin and relaxing, the external os admitting two or more fingers. It is irrational and unsafe to attempt to open by force a cervix that is not prepared for dilatation.

The surgical plan of solving the problem of the obstructing cervix, as represented by the Dührssen operation is rational and safe in the class of cases to which it is adapted. The operation is a necessary part of the equipment of the obstetric surgeon. It is complementary to the operation of dilatation, being applicable where that operation fails. It is especially useful in eclampsia and toxemia in the early months of pregnancy. It should be the operation of choice in all cases where the cervix does not permit of easy dilatation, except in the primiparæ, at or near term with rigid perineum, small vagina, and cervix high and not easily exposed, and the condition of the soft parts such that delivery will be slow even after the cervix is opened. In such a case the difficulties of the operation make abdominal Cesarean a quicker and safer method of delivery.

It will rarely be indicated in placenta previa, and then only in the early months when the cervix is rigid and the placenta attached to the posterior or lateral walls of the uterus.

In accidental hemorrhage in the early months it is the ideal method of emptying the uterus; in late pregnancy it must compete with abdominal Cesarean section.

Its chief indication will be found in eclampsia and toxemia of pregnancy, where it will meet the indication for rapid delivery more frequently than any other plan of dealing with the problem of the obstructing cervix.

NERVOUS PHENOMENA AS SEQUELÆ OF CHANGES IN
THE PELVIC VISCERA.

BY

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IN discussing this subject I expect to meet opposition. It is an unsettled and much disputed subject. The nervous phase of any pathology is too often considered uninteresting. It is like many so-called idiopathic diseases or conditions which require only keen thought and study. No branch of medicine is uninteresting when well understood. It is the want of knowledge on our part that makes diagnoses difficult. Our complex organism is made up of many systems, each again subdivided into smaller systems, and so on. It requires all of these systems and sub-systems to create one general system. There is no machinery so far devised by man, whose mechanism is so complete and faultless as that of the human body. It is so perfectly constructed that if not artificially disturbed it would continue in normal condition until destroyed by time limit alone. Each system in its make-up has its special influence over every other part of the body. The disturbance or irritation of one sub-system is felt throughout the entire organism.

Neither time nor space will permit my giving divisions or controls at this time, hence I shall content myself in discussing only the two systems named in the title of this paper, and their phenomena.

The close relationship of the nervous system and the pelvic viscera has been discussed since the earliest advent of medical literature, yet it has not been given due consideration by others than the psychologist. The psychologist has had greater opportunities to study the different phases of the nervous system in the institutions in which he has become a necessary fixture than has any other specialist.

If we make a special study of any subject we are apt to become over-enthusiastic and lose all interest in other branches. An opposing factor is a necessary adjunct. Hence the general surgeon, gynecologist, or internist would seem a valuable associate. We find the boundary line of these specialties touching, coalescing, and even crossing. It is only the keen

diagnostician who will be able to know where they touch and where they diverge. Could their ideas be similar and conclusive they could become co-laborers when the necessity demanded it or act their independent part when the patient required it, thus relieving both body and mind.

The sacred book as early as 1800 B. C. refers to the different physiologic epochs and their sequelæ. Herodotus mentions these phenomena, as occurring at the time of a change in the pelvic organs either by disease or normally, as devils, and manuals were written giving instructions how to chase them from the organs affected. Hypocrates was the first to suggest that changes in the uterus were causative factors in the production of hysteria.

In our review of medical literature we find the medical men of early times much interested in the close relation of these conditions with diseases of the genital organs. The earlier the history the more certain were they of the intimate relationship. They considered not only the pathologic, but the physiologic changes as being equally as important a factor in the production of the different nervous phenomena.

The word hysteria was used to distinguish one condition. This nomenclature is suggestive of their belief, for the word hysteria is derived from the Greek word *ἵστερα*, meaning womb.

This variance of the normal nervous conditions occurs most frequently during the developmental period. This suggestive name is still used to distinguish the same condition.

The importance of the early training of young girls is not appreciated by the parent, and not made impressive enough by the attending family physician. The instruction to the young female is paramount to all others at the time of her normal epochs. The sanitary laws are enforced about the homes and throughout the congested portions of the cities, but who is there to see to the training of these young girls so that their nerve force will be sufficient to withstand the new phase of life upon which they are now entering. The high-strung nerve-exhausted society-seeking mother is neither fitted nor inclined to give the proper training.

Though the companionship of a mother is all important at this time in the daughter's life, yet if she be of a highly sensitive nervous temperament the child should be taught to retrace rather than follow her footsteps. This certainly is a more important duty of the family physician than that of a sanitary advisor.

New nerve force is required at the time of puberty. There is inaugurated a change of thought and desires. The aim in life is different. There comes a time in life later designated "change of life," yet there is no time in the female's existence when there is a more complete "change of life" than at puberty. This is at a tender age, and to prevent nerve exhaustion is all important. The girl at this age should not be crowded into higher studies, either in literature or music; neither should she be compelled to take up the nerve-wrecking society duties. Rather should she be encouraged to seek out-door recreation, so as to build up her nerve force and be able to supply the demand when called upon.

Much stress must be endured by the nervous system, even at the time of the normal changes; how much greater must be the task when pathology exists.

I have in mind a case lately referred to me, a female child of about five years, with a severe chorea, accompanied about every four weeks with spasms. Close questioning of parents elicited but little of value as to the cause. I naturally would look for a genital cause, and was successful in finding an adherent prepuce with confined smegma. The irritation from the smegma caused congestion and edema. The pressure from the swelling caused venous stasis in the erectile tissue producing hyperactivity. This was a persistent irritation productive of the nervous phenomena. The diagnosis was proven by the removal of this irritant completely stopping the nervous phenomena.

Do not understand me to contend that all nervous systems will be overcome by a localized irritant, yet it is important that such irritation be not overlooked.

These nervous disturbances occur suddenly or slowly in proportion to the resisting power of the nervous system or the severity of the irritant. The irritation may at first seem slight but oft repeated will finally disarrange the nerve cells, and be productive of permanent central lesions.

I am sure that you will agree with me that mental derangement is often produced by disease of the procreative organs and that the functions of these organs are materially diverted by the mental disturbance. It requires the greatest care on our part to determine the primary causative factor. Either may be primary and causative or secondary and resultant.

There is no set of organs in the female anatomy that so influences the nervous system as do the pelvic viscera. I have

among my patients now a woman who in rapid succession gave birth to five children. The result was an extensive laceration of the perineum and cervix, with the usual resultant pathology, a rectocele, and cystocele with dribbling of urine. She had a shattered and torn nervous system as a result of the neglected trauma of the pelvic outlet. The culmination of all this trauma and consequent systemic drain produced a troubled mind to the extent of developing extreme melancholia. This should not be considered as really reflex, but as due to nerve exhaustion as a result of continuous over-activity of the center affected.

It has been shown by Dr. Dodge, of London, that when the nerve cells are fatigued by continued stimulation or irritation, the nucleus of the cell decreases in size and changes shape. It is a reasonable inference then, that human beings who allow their nervous systems to be constantly irritated or fatigued finally have such a derangement of nerve cells that normal repair does not occur and the cell-bodies and nuclei lose their normal anatomical structure.

We have studied more carefully the effects that diseases of the generative organs have in producing and keeping up disturbed mental conditions than of the disturbance of the generative organs by the mental conditions.

The gynecologist, following up his special work, investigates and discovers whether there exists any pelvic pathology, but the psychologist may see many insane patients and overlook the pelvic viscera. This is not an uncommon occurrence, for in the insane the derangement of the mind obscures all symptoms of the bodily disease, while diseases of the genitalia are not likely to cause one to overlook insanity.

It is the rule to attribute many nervous phenomena to the reflexes but this must not be considered universal. Mental equilibrium is often disturbed in the highly sensitive by acute disease, or displacements of the pelvic viscera, or even physiologic changes. During exacerbations these patients often refer to certain seeming pathology. This is usually passed as only fanciful and not made a part of the record. This should not be so considered until such examination be made as to positively exclude such a condition, the same as we would in those mentally responsible. A case reported in *The Journal of the A. M. A.* recently was that of a notorious hysterical woman who developed symptoms of bowel strangulation, even to stercoraceous vomiting. The condition of the nervous system overshadowed all

else and the patient was allowed to die. Autopsy disclosed a loop of the jejunum strangulated. I believe it is our duty to treat these conditions in the mentally weak the same as we would in those mentally responsible. We may not obtain the results expected at all times yet the proper treatment cannot be harmful, but will relieve many and cure some.

My interest in this class of cases has lead me to spend considerable time in the asylums, studying the different nervous phases represented there. Only recently I made a profitable visit to the Oklahoma Hospital for the Insane at Norman and append the history of only a few of the conditions found there. Many unfortunates are there complaining of some pelvic trouble, fanciful or real, and asking for relief.

CASE I.—Mrs R., a native of Mississippi, aged thirty-seven, entered hospital February 12, 1911. She is married and has had three children, one is now living and well, while the other two died at an early age, cause unknown. The first delivery was instrumental, and was the cause of her remaining in bed for several weeks. Family history was negative.

She is uneducated and has done house- and field-work most of her life. When she entered the hospital her mental condition was one of melancholia with hallucinations. Her judgment was poor. Ideation, volition, association and memory about normal, with feeling depressed. Pulmonic and aortic stenosis existed. Her general health was apparently good until about four months ago. She was seventeen years old at puberty. Menstruation was irregular. Early the flow was profuse, but later scant and followed by an irritating leukorrhea. Constipation was invariably present. Pain in spine from occiput to sacrum; pain was frequent also in top of head.

Present examination shows heart as above described, lungs normal; palpation over abdomen revealed no pathology. Digital examination demonstrated the existence of an extensive laceration of the perineum with rectocele and cystocele. The laceration was a lateral one extending high up into the vagina. No attempt had been made to repair it and it had healed by granulation, leaving an extensive scar.

She dates all her illness from the time of her "Female Trouble" as she terms it, and says that if she were free from that trouble she would be all right.

This, as we probably all believe, may be a fancy or a fact. Let it be as it may her symptoms of an unbalanced nervous system date from the trauma, which resulted in the existing lesions, so it must have been a factor in its onset and evidently an irritant sufficient to prompte its continuance.

The removal of this irritation may not be sufficient to re-establish the normal equilibrium, yet it will be the destruction of one of the causative factors. Restoration to the normal will certainly be more easily accomplished with this irritant removed.

CASE II.—Mary E., entered hospital October 29, 1909. Age, thirty-two years; born in Indian Territory. She has had one child, which is living and well. Family history is negative. She has had occasional epileptic seizures since a child but a clear mind between attacks. Her unstable mental condition followed the birth of the child. Pelvic pain, variable as to location and severity, has existed since leaving the parturient bed.

Examination showed chest and abdomen normal. Sclerotic coat of eye and mucous membrane of mouth was anemic; muscular development not good; muscles of abdomen very thin and flabby; the normal deposit of fat was wanting. Digital examination showed an almost complete procidentia; and extensive bilateral laceration of the cervix with everted lips which were covered with bold granulations. In places there existed fissures and erosions due to the exposure of the parts to the air. The cervix was elongated and indurated equaling in circumference the fundus. There was a laceration of the perineum down to and implicating most of the fibers of the sphincter ani muscles.

Her only relief is while in the recumbent position. Standing aggravates all the symptoms. The prolapse of the bladder, caused by the displaced uterus, leads to incomplete emptying of the viscus and decomposition of urine is the result. This residual urine acts as an irritant to the bladder, and to the urethra while being voided. The mental phase of this case is exaggerated melancholia.

CASE III.—Mrs. H. entered hospital, October 25, 1910. Age, sixty; married; weight, 110 pounds; height, 5 feet 1 inch.

On date of entrance her temperature was 98; pulse 74; respiration 24. She was born in the Cherokee Nation; her parents were natives of Virginia; her education was that of the sixth grade. Her occupation has been that of chambermaid and field- and house-work. Her menses began at the age of fourteen years; the amount was normal, but the pain was severe just preceding the flow. She now has leukorrhea and her bowels are constipated. Her health was good until about five years ago when she began to have distress in the pelvis. Painful urination and finally incontinence of urine resulted. This latter was a source of much annoyance to her. Melancholia developed and this was her condition when she entered the hospital.

Further observation showed that her patellar reflexes were increased; her pupillary reflexes were decreased; eye sight diminished; arcus senilis existed; slight backache, and but little headache.

Upon digital examination a large solid mass was found, centrally located, and firmly adherent just above the symphysis pubis. It implicates the uterus and posterior portion of the bladder. She complains that if that pain and the bladder trouble were cured she would be well and could go home.

This patient complains constantly of a burning pain in the pelvis and of incontinence of urine. It is true that these complaints in the mentally deranged cannot always be depended upon, yet when we have a history so complete as this as to time and conditions and can verify the same by examination, then we feel to remove them would be only just and proper. It would be our duty to recommend such a procedure in the same and it certainly is no less a duty we owe to those who are not mentally able to decide for themselves.

Any one at any age has a more sensitive nervous system at a time when there is a change taking place, either progressive or retrogressive. One with a chronic pathologic condition as a source of disturbance of the entire nervous system, or a special division of the same, will be easily overcome. All pelvic abnormalities do not become nerve irritants, neither is it true that all nervous systems succumb to the irritant, let it be ever so severe.

The causes may be attributed to sources of irritation on the base of a neuropathic tendency. Thus a child of neurasthenic parentage is most apt to be a victim of convulsive seizures at the time of the physiologic epochs.

I have noted many times that those patients who had been subjects of spasmodic seizures in childhood were most apt to exhibit similar phenomena at the time of a physiologic change. This thought inculcated in the history of all such patients would be of much assistance in determining the primary cause. It must not be considered that these normal changes are sufficient to produce such nervous phenomena in otherwise equally balanced nervous systems, but only in those of lowered nerve force. We feel all the more certain of this relation when we are confronted with the fact that by the correction of the pathology, or when time has completed the physiologic process, the mental aberration disappears.

This condition might well be considered as reflex, but again changes do take place where reflex action has no part; as example, constant and long-continued mental disturbance. This long-continued suffering is sufficient to impair brain nutrition direct and produce insanity. The exhaustion produced by the irri-

tation is the predisposing cause while the impairment of the nutrition of the brain is the direct cause.

Menopause in a woman whose mental stamina is not good may be expected to increase the mental enfeeblement instead of producing more favorable conditions.

Amenorrhea is the rule in the insane, for slight nerve derangement or mental anxiety is sufficient to cause suppression of the menses; again there are those among the insane who menstruate regularly or suffer with menorrhagia, which latter is symptomatic of the existence of pelvic pathology.

Nerve irritability and hyperemia excessively developed in the uterine structure without organic changes are known as functional affections and usually subside in the insane. This has led the psychologist to pass the pelvic history without question. This is not the case with organic diseases, however, and it is these that are productive of nerve exhaustion.

We cannot logically dismiss the fact that diseases of the genitalia exercise a most important influence in causing insanity and preventing a recovery. As examples, a sclerotic or apoplectic ovary, extreme displacements or unrepaired trauma, may all or either be sufficient irritation.

We can understand how functional diseases may be improved in the insane without attention, but organic conditions are aggravated by this unstable condition of the mind.

These unfortunates do not always refer directly to the existing trouble and hence are neglected more than would be those of a sound mind. They are at a double disadvantage, as the pelvic pathology aggravates the nerve lesion and the nerve lesion prevents proper protection to the pelvic trouble.

In certain forms of insanity we have an anesthesia produced which lessens the severity of the pain, yet the disease continues to progress.

It if be true that disease of these organs *can* become sufficiently irritating to precipitate an attack of mania or insanity, it certainly, if allowed to continue, will be sufficient to prevent a recovery. The proper treatment is appropriate here as under any other circumstances. The cures will be in proportion to the duration and severity of the attacks. So the earlier the attention is given the more perfect will be the result.

Subacute mania, dependent upon some disease of the genitalia, will be greatly benefited, while in chronic mania we cannot expect such pronounced results.

Pathology present in one set of organs may lead to pathology elsewhere. If the primary lesion be removed before the secondary becomes established as an independent condition, much good may be accomplished, if not little may be expected.

An unbalanced mind may mask many abnormal conditions which otherwise would be readily discovered. Much more care is required in taking a history in these cases than in those who are sound mentally. It is surprising to note how incomplete is the history, pertaining to the genital organs, found on the history sheets in many of the asylums for the insane, yet there is no class of cases requiring so complete a history as those who enter these institutions. There is no system of organs that should in any way be slighted, for there are none that might not be a factor in the production of an unstable nervous system. This is why I have said that not enough time is spent at most of the institutions for the insane to acquaint ourselves with the actual primary cause of the condition. The history, as to the nervous symptoms, is complete and accurate but as to the underlying source of these symptoms it is very incomplete. Our diagnostic ability is taxed to the extreme in the history-taking and making examinations of the unresponsive mentally. They require the most exhaustive examination to disclose the real cause.

We are prone to treat lightly many complaints of the nervous woman. We may nominate the condition suggested by the symptoms observed, without finding the actual pathology. Time is always well spent in making a thorough search for the primary cause of any pathology. We note the action of one part of the nervous system over the other when an irritant in the intestines or the passing of a renal calculus gives rise to convulsions; when reflex paralysis occurs; when melancholia is produced by visceral disease; or when, on the other hand, constant irritation of the ovary leads to that form of insanity known as nymphomania.

The fundamental symptoms of neurasthenia are produced by the inability of the individual to resist the pathologic forces which act upon the individual organism and its constituent cells. Primarily this weakness is congenital. We come into this world with unequal powers of resistance. We are not all able alike to cope with the physical, intellectual, and emotional stress that enters our lives. Ofttimes the cause of congenital mental and muscular weaknesses are not to be determined.

Neurasthenic children are not necessarily of neurasthenic

parentage, but neurasthenic parentage may be the cause of mental instability in the offspring. There is no way of determining when the resisting power will be overcome, nor what will be the character or severity of the cause.

A child may be able to equalize all its forces, remaining bright and active until the physiologic epoch of puberty, when new nerve force is to be utilized, new lines of thought are introduced, in fact a change of the entire mechanism takes place. The being once so active and energetic, becomes listless and inactive; once bright in her studies, now falls behind and does not care; she is now obverse to everything. This is not characteristic of those who have a well-balanced nervous system, but only of those who have a hereditary tendency, or who have acquired the condition through disease, or their neglect to obey the dictation of their nerve force.

Records of cases at different asylums show that one of the most important causative factors in the production of abnormal mental conditions is frequent child-bearing.

I have in mind now a case who has recently recovered from confinement. This is her third child and each time following the puerperium it has been necessary to confine her in a private asylum, with the constant care of a competent nurse. She is apparently in good health at all other times.

Puberty, child-bearing, and menopause are all physiologic occurrences and it might be asked why should they produce mental disturbances. It is because of the depressed nervous condition at this time, it being unable to bear the extra stress imposed.

How often are we unable to determine the primary irritant in the well-known condition called migraine? It is of very common occurrence yet so difficult is it to determine the true causative lesion that we too often resort to drugs for relief only, and allow the patient to go on in the same routine of repeated attacks. Faddists are too prone to seek for the only and certain cause within the bounds of their specialty, yet others who are not so enthusiastic are content in giving temporary relief without seeking for the cause.

When the general reflex vascular hypothesis is considered it can be more readily understood how the removal of the various peripheral irritations give relief.

It is unwise for us to disregard the demonstrated clinical fact that remote irritants do precipitate an attack of migraine.

The severity of the attacks are in proportion to the stability of the nervous system.

We frequently consider eyestrain, or diseases of the turbinates and adenoids, but how few of us inquire into the condition of the pelvic organs sufficiently to exclude the possibility of the irritant being present in some simple pathology there. We may err in making too little these varied irritants as well as in making them the sole and only cause.

We often will be surprised at the relief obtained by dilating a contracted cervical canal or removing scar tissue from a lacerated cervix.

Vomiting of pregnancy, a reflex nervous phenomenon, is often promptly relieved by dilating the cervix. A case of persistent vomiting of pregnancy was recently referred to me. The physicians in attendance, after trying all the known remedies for the vomiting, had resorted to morphine which did give relief. An examination revealed a constricted cervical canal just within the external os. When this was dilated the vomiting ceased, but the "dope" habit now existed and was much more serious than the original trouble.

Even a little scar tissue in the cervical canal, caused by caustics or trauma following the use of a stem pessary or otherwise, may prevent the normal softening and dilatation of the canal and thus become a direct irritant.

Following up the statement of Charcot, I can report the following case:

Miss L., age nineteen, a farmer's daughter. She had done much hard work both in and out of the house. She enjoyed horseback riding and athletic feats in general, being proud of her muscular development. She began menstruating at the age of twelve years. She flowed freely at first but suffered some pain in the ovarian region, which was more severe just preceding the flow. She has had children's diseases only. Her father, mother, and an only brother are living and well.

Her much coveted college education was neglected on account of her inability to confine herself to study. She gradually grew worse, severe dysmenorrhea developed, becoming more severe at each period. Twitching of the muscles of the upper extremities and trunk became noticeable. This condition grew worse until clonic spasms of these muscles would occur at each menstrual period. The flow became more scant, headaches more severe, and the face flushings and muscle twitchings more frequent. At the time she consulted me she was very nervous and unable to do work of any kind.

An examination determined: Pupillar reaction normal;

sclerotic coat of eye and mucous membrane of mouth anemic; tonsils slightly enlarged and irregular; teeth normal; glands of neck normal; respiration normal; pulse 80, soft and compressible. The heart shows a slight functional systolic murmur. Spleen, liver, and kidneys normal in size and position. Tenderness was found by palpating over the epigastrium. Pressure over the right or left lower quadrant of the abdomen elicited tenderness and provoked repeated clonic spasmodic contractions of the muscles of the abdomen and trunk. Bimanual manipulation of the ovaries produced similar phenomena.

Closer examination revealed a retroverted uterus, a cystic condition of the right ovary, and a small cyst of the left ovary.

A laparotomy was advised and done. The suspected cyst of the ovary proved to be a hematoma the size of an orange. This I removed and did a resection of the right ovary and corrected the displacement. The result was a cessation of the symptoms and a rapid gain in weight and strength. She menstruates normally now and is free from the former nervous phenomena.

This case represents only a few from which we may expect such phenomenal recoveries, yet with only a small percentage of recoveries, a greater number improved, and a still greater number uninfluenced, we should still be encouraged enough to feel it our duty to attend to any pathology which is so situated as to be an irritant.

Several medical men of no mean ability had seen this case and because of the inaccuracy in diagnosis called it nervousness. This word like many others in medical nomenclature answers as a shield to protect the incompetent and careless diagnostician.

Another similar case follows:

Miss C., age fifteen years, weight 100 pounds. Her occupation was home-work. She began to menstruate at the age of thirteen years. She was regular but suffered severe pain just preceding the flow. This pain was referred to the ovarian region. Family history was negative.

She had scarlet fever at the age of twelve years, at which time she complained of pain and tenderness in the ovarian region. Following this sickness she had a profuse leukorrheal discharge which was much worse just before and following the menses. The approach of the menses was marked by dizziness, a feeling of sea-sickness and fainting. Each period was an exaggeration of the previous one, until the time usually allowed for recuperation became a restless, uneasy space of time with a dread of what was to come.

Some twelve months previous to my visit to her, one year after the menses were established, her periods were complicated by spasmodic seizures. These attacks preceded the flow and were followed by coma. She would remain in this semiconscious condition the most of the time for a week or ten days.

An examination showed the left ovary much enlarged, hard and tender. The right one small, hard and irregular in outline. The uterus was enlarged and tender. The cervix was sensitive, indurated and eroded.

A laparotomy was done, and the findings were that the left ovary was apoplectic, with the coverings thick and inelastic. The left ovary was small, pale and sclerotic. The pelvic veins were extensively varicose. Both ovaries were removed together with the varicose veins. Although the operation was followed by acute dilatation of the stomach, the patient left the hospital in about two weeks. At first the nervous disturbance was extreme at the time for the menses, but gradually subsided each month until now, two years after the operation, she is practically free from these attacks.

This patient's nervous system had not the power to resist the severe local irritation and was overcome at the time in her life for the appearance of the physiologic epoch.

A certain intrinsic condition of the brain, in the nature of an instability of function, is a frequent result of long-continued nerve irritation. So in these cases the earlier the primary irritation is removed the more favorable is the prognosis. Even the convulsive seizures of a reflex nature must not be lightly considered, for they may be quite as serious as concerns the mental and moral deterioration as are those of an essential nature. Either may be the starting point of a serious disturbance in the function of the growing nervous system and result in grave neuroses.

The following case referred to me by Dr. Paul Friedemann, of Stillwater, Oklahoma, is a lesson within itself:

Mrs. L., age twenty-four, a native of Nebraska, married five years; family history negative.

The first pregnancy was normal, but the labor was tedious and followed by infection which confined her to her bed for four weeks. She did not fully recover but had severe pelvic pain at times, which was aggravated by walking. Pallor was extreme and tinnitus aurium and syncope was of common occurrence. Later developments were headache, lumbosacral pain, feeling of weight in the pelvis, metrorrhagia, and leukorrhea. These symptoms grew more severe until the attacks of dizziness and fainting would occur several times daily. She would fall suddenly and remain unconscious for some time. Paresthesia developed in the limbs, often being accompanied by anesthesia. Hyperesthesia in the ovarian region was constant. These spells, as she termed them, continued growing worse for about four years. She took many voyages, stopping at various health resorts with but little relief.

Examination showed the reflexes slightly exaggerated, tremor present in the upper extremities. A slow careful examination of the chest and upper abdomen elicited nothing abnormal, but any sudden movement caused contractions of the muscles of the entire region. Pressure over the ovarian region produced severe pain, more marked on the right side. Digital examination showed retroversion of the uterus with extensive bilateral laceration of the cervix. The right ovary was enlarged, cystic and closely adherent.

Operation was advised and I did a curettage, a trachelorrhaphy, a right salpingoophorectomy and shortened the round ligaments. She had an uneventful recovery, and now, four months after the operation, is free from the nervous phenomena which existed previous to the operation.

This case demonstrates clearly that the pathology found and removed was the real irritant productive of the nervous phenomena. This persistent irritation was severe enough to cause a continuous loss of resistance and an increase of its power over the controlling nerve force.

The longer these conditions were allowed to exist the more pronounced were the symptoms. The origin of the symptoms dates from the occurrence of the lesions, and while the pathology remained unaltered the condition grew worse. Very soon after the removal of the irritant the nervous manifestations subsided and the patient became normal mentally and physically.

I might continue indefinitely citing cases which would demonstrate the points under consideration, but those appended will suffice. When we consider carefully the relation existing between the nervous system and the pelvic viscera we can but realize the influence that either may have over the other.

Let this realization become established, and then the change, either pathologic or physiologic, take place, and we will be convinced of the existence of the nervous phenomenon and its primary cause.

COLCORD BUILDING.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of December 12, 1911.

The President, WM. E. STUDDIFORD, M. D., in the Chair.

DERMOID CYST OF OVARY OF RAPID GROWTH.

DR. GEORGE H. MALLETT presented this specimen. The patient from whom it was removed was married and forty years of age. She had had four children, the youngest four years old. Her menstruation was regular, the last being on May 29, 1911. She entered the hospital July 11, 1911. She did not remember when she first noticed the enlargement in the right iliac region, but thought that it was about six months ago. Seven weeks ago she began to have pain. The physical examination revealed a large mass bulging in the right fornix and which gave a wave impulse. A large and rounded mass was felt in the right iliac region. On June 29, 1911, operation was performed and a large pedunculated cyst of the right ovary was found. It was unilocular and free of adhesions and about the size of a grape fruit. The left ovary was examined and found to be normal in size and appearance. The patient made an uneventful recovery and left the hospital in twelve days.

On August 21, 1911, or fifty-two days from the time of her former operation, she again entered the hospital. She said that she had begun to suffer pain on the left side two weeks before entering the hospital the second time, or thirty-eight days after her former operation. She had menstruated four days before, having missed the month of July. He then felt a large, movable mass in the left lower quadrant which was movable and not sensitive to touch.

On admission a long elastic mass was felt below the umbilicus and attached to the uterus. A second operation was performed on August 23, 1911, or fifty-three days after the first operation. This cyst was found adherent to the top of the uterus. It had a long pedicle and was free from adhesions other than those to the uterus. It measured about 4×6 inches and contained black hair suspended in a fatty substance which congealed upon exposure to the air. The inner surface of the sac had all the appearances of skin and contained sweat glands.

The pathologist had labelled this specimen teratoma, undoubtedly agreeing with Adami and Nicholls who considered the term "dermoid" misleading. It was commonly held that dermoids were cysts composed of more or less modified skin with

other structures of epidermal origin. But in the light of recent researches, careful study had shown that even the simplest of them contained structures from other primitive germinal layers. Therefore, the distinction between dermoid and teratoma was an artificial one; the generic term "teratoma" should have, as Wilson suggested, the name "enthymatoma" for this class of tumors. These are described as tumors of slow growth and are reported by Kelly as having been noticed about three months before operation by the patient; this was not convincing because the patient not having been operated on before there was no way of ascertaining when the growth started.

DR. ROBERT T. FRANK reported a case of

EXPULSION OF UTERINE CAST. DIFFICULTY IN DIAGNOSIS.

At the last meeting of this Society, Dr. Coe, in the discussion of my paper on the "Interpretation of Curettings," brought up the question whether the fact that a monthly formation of premenstrual mucosa which closely resembles a decidua is now recognized, obliged us to alter our interpretation of decidual casts in ectopic. I preferred to postpone the discussion of this subject to the present time, as I wanted to take up this point in connection with the clinical case which I shall present to-night.

The mucosa surrounding a *very early* intrauterine pregnancy (of two to three weeks) frequently cannot be distinguished from a premenstrual mucous membrane or from a fresh dysmenorrheic membrane. At a later period the differentiation is rarely difficult as the decidual reaction in pregnancy far exceeds that accompanying the cyclical change.

The pathologist is, likewise, almost always able to distinguish between the uterine cast, expelled or removed from the uterus, in ectopic gestation and the material obtained from a uterine abortion in the early months. The differentiation is based upon the finding of chorionic villi scattered among the decidua in uterine gestation, and their complete absence in uterine casts of ectopic pregnancy. It is self evident, however, that a sufficient amount of material must be examined with care.

I desire now to report a case in which the examination of the material misled me, although all proper precautions were observed. Mrs. W., aged twenty-seven years, was confined by me three and one-half years ago. Since then she had been well and menstruated regularly. On August 19, I was called to see her. The following history was obtained: The last menses had occurred two months previously. She believed herself pregnant (nausea, increase of breasts). Two weeks before I saw her she spotted for a few days. Yesterday she bled slightly. To-day, August 19, she again bled somewhat more profusely, and fainted. The patient who is emotional, had fainted a number of times during the last few years. She had had no pain, and felt no uterine contractions. I found the patient pale; her general condition

good, pulse 88, temperature 98.2°. There was a moderate amount of dark bloody flow, no clots. The uterus was slightly enlarged, no distinct Hegar's sign could be obtained, and the right adnexa were tender and appeared slightly enlarged. She was left in bed and carefully watched. For the next two days the same symptoms continued. On the third day she passed a small mass which consisted of a typical triangular uterine cast, complete except for its extreme fundal portion. Immediate microscopical examination showed only a *fully developed decidua* with absence of villi. I felt fully justified in making the diagnosis

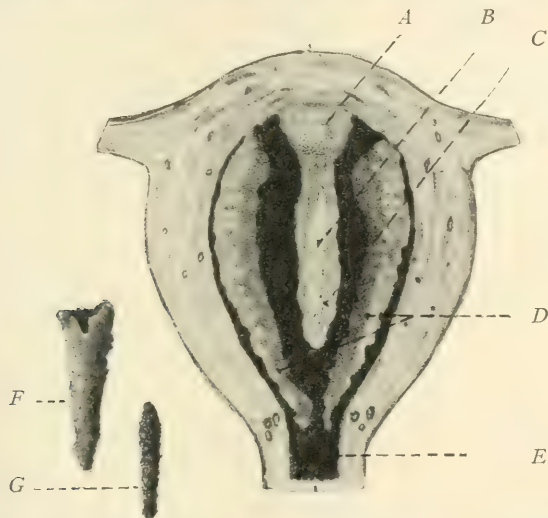


FIG. 4.—A. Attached decidua. B. Ovule cavity. C. Wall of ovum. D. Uterine cast (detached decidua). E. Blood. F. Uterine cast. G. Blasted ovum.

of tubal gestation, and from the subacute course, of tubal abortion. I decided to await further developments, but determined to transfer her to the hospital for safety sake. Just as the patient was ready to leave her home—this was on the next day—I was informed that she had passed a smaller, more elliptical mass. This was also submitted to examination, and proved to be a small (perhaps four weeks old) degenerated ovum, surrounded by organized blood. She rapidly recovered under simple rest in bed and small doses of ergot.

The mode of detachment and expulsion can be reconstructed with considerable certainty by means of the gross appearance of the cast and ovum. Unusual care had been exercised, from the beginning, so that I could feel certain that no masses had been overlooked and thrown away. I believe that two weeks before the ovum had become separated from the decidua by slow and progressive hemorrhage. The blood had completely enclosed the ovum. Then, later, further bleeding had detached the decidua

which was expelled first, and lastly the ovum was extruded. As a rule, however, we may expect at least a few villi to adhere to the decidua, so that, just as heretofore, we should attach vital importance to decidual casts in suspected cases of ectopic. Such an unusual concatenation of events as the one in my case must prove a very rare exception.

DISCUSSION.

DR. HERMAN GRAD said he was very much interested in the report made by Dr. Frank and wished to ask him if he did not think that the pregnancy might have been in the horn of the uterus. A few years ago he had a case presenting similar symptoms and in which the fetus came away first. A tentative diagnosis of an ectopic gestation was made. The fetus came away but the membranes did not. The patient was placed under an anesthetic and a very definite mass on the uterus was made out. The pregnancy was way up in the horn of the uterus. He asked Dr. Frank if he might not have been dealing with a similar condition. It would explain the presence of the uterine cast and the subsequent expulsion of the ovum also.

DR. ROBERT T. FRANK thought that an apical pregnancy might be excluded in the case he reported. In the first place the consequence was unlike the usual; first came the cast and then the ovum. If the ovum had not been found or had escaped attention, he might have remained in doubt. In the second place the uterus was quite symmetrical in shape. The right-sided mass which was felt at the first examination persisted and, therefore, could not be ascribed to the uterus. He thought that pregnancy existing in the horn of the uterus, as suggested by Dr. Grad, might be excluded with a definite certainty.

DR. HERMAN GRAD read a paper on the

PREPARATION OF PATIENTS FOR OPERATION AND THEIR AFTER-CARE *

DR. WILLIAM P. HEALY made a report on the

PREPARATION OF PATIENTS FOR OPERATION AND THEIR POST-OPERATIVE CARE IN THE GYNECOLOGICAL DIVISION OF ROOSEVELT HOSPITAL.

Preparation for operation: Night before operation patient is given a tub bath if possible, otherwise a bed bath. The field of operation is shaved and patient receives a half ounce of castor oil. In private patients the field of operation is not shaved until patient is under anesthetic at time of operation, then it is dry shaved.

* For original articles, see page 404.

There are no soap poultices, bichloride compresses or dressings of any kind left on over night.

For a morning operation patient is given a soap-suds enema at 5:30 A. M. and another at 6:30 A. M. After the second enema a saline douche is given and entire abdomen from ribs to vulva and out to flanks is painted with 3.5 per cent. solution iodine and covered with a dry sterile dressing.

This remains on until one hour before operation and then the abdomen is given a second application of the 3.5 per cent. solution iodine and again covered with a sterile dressing. At this time the vulva is scrubbed with green soap and sterile water and covered with a dry sterile dressing.

When patient reaches operating-room the final preparation is done with the patient on the table under the influence of the anesthetic and ready for operation. This preparation is a repetition of what was done one hour before, *i.e.*, vulva and vagina are thoroughly cleansed with green soap and sterile water, great care being observed to protect the mons and suprapubic region from the water and soap by the firm application of a dry sterile towel to these parts. An application of the 3.5 per cent. solution iodine is made across the pubes and upper portion of vulva before the scrubbing takes place.

Then at the termination of the vaginal surgery and just before the abdominal operation is started the abdomen is given the third and final coat of 3.5 per cent solution iodine.

Except for the half ounce of castor oil the night before operation, there are no standing orders of any kind for medication such as morphine or atrophine before or after operation.

All patients void just before going to operating-room and they are not catheterized unless it is necessary to do so on the table.

After operation no patients are catheterized if they are able to void, otherwise they are catheterized every six or eight hours. Simple curettage cases, if necessary, are allowed to sit up in bed to void.

All but curettage cases are kept on their backs for at least twenty-four hours, with a pillow under head and another under knees.

Fluids consisting first of hot water, then cold water, albumen water, etc., are started six or eight hours after operation.

In practically all cases the bowels are moved the third day after operation by means of calomel, and salts and a soap-suds enema.

Light diet is ordered after the bowels move.

Curettage cases, including endometritis, incomplete abortion, and stem-pessary cases are all home by the seventh day. The stem-pessary cases return once a week for inspection until the stem is removed at end of fourth week.

Cases with plastic work on the perineum and cervix are up on the fourteenth day; silkworm-gut sutures out from tenth to fourteenth day. The perineum in these cases is flushed twice daily with peroxide and salt solution and a daily boric douche given if there is a leukorrheal discharge.

Complete lacerations of perineum are put upon constipating diet for two days before operation and are given one ounce of castor oil forty-eight hours before operation with two or three soap-suds enemata the morning after the oil; no laxative the night before operation, no enemata the day of operation. On the third or fourth day following the operation the bowels are opened with castor oil by mouth and 4 ounces of olive oil per rectum, soap-suds and glycerin enema being given just before the bowels move. Patients are then put upon light diet and given a laxative every night.

The silkworm-gut stitches are removed from the rectum about the fourteenth day under general anesthesia and patient is allowed out of bed a day or two later.

Abdominal operations with a transverse incision are out of bed on fifteenth day; median incisions remain in bed a day or two longer.

Posterior drainage in abdominal cases, the patient is given a douche on third day and gauze removed, as a rule no more is inserted.

Posterior colpotomy for pelvic abscess, the packing is removed and thereafter cavity is irrigated and fresh drain inserted every other day. Persistent vomiting, gastric lavage and rectal irrigations. Tympanites: turpentine stupes, oxgall enemata, rectal tube, and rectal irrigations.

DISCUSSION.

DR. SAMUEL M. BRICKNER, before going into details of the paper, would like to ask Dr. Grad if he had ever met with any disastrous effects from the use of scopolamine and morphine. He also asked why he used calomel in patients requiring operation suffering from syphilis. It surely could not be because a single dose of calomel could or would exert any effect upon the syphilitic process which had been going on for months and possibly years. He asked Dr. Grad to interpret his reasons for giving calomel to these syphilitic patients.

There were a few things in Dr. Healy's paper that required remark rather than criticism; for example, the removal of gauze from the pelvis when it was used for any reason requiring drainage. Why was it removed on the third day? In Dr. Brickner's experience it was better to leave the gauze in six, seven, eight or ten days; the gauze was then easily separated from the granulation tissue and could be drawn out without discomfort to the patient and with great facility.

As to intestinal distention after laparotomy, he made the following suggestion: In case a patient had considerable gas following the operation, a very easy method of procedure, giving no discomfort to the patient and producing a ready expulsion of the gas, was to insert a hard rubber tip, such as comes with a fountain syringe. This was left in place one, two or three hours and was extremely effective in bringing about expulsion of gas.

He said that if he had any criticism to make of Dr. Healy's paper, it was of the routine administration of calomel and salts after operations, particularly after laparotomies. In the First Gynecological service at Mount Sinai Hospital no patient after undergoing a laparotomy ever received a laxative or cathartic to produce a bowel movement. They used a rubber tip, or a rectal tube, or turpentine stupes. If the patient had no bowel movement in two, three or four days they gave her a low soap-suds and glycerine injection and that mixture caused a movement of the bowels without any difficulty. Every day thereafter a bowel movement was caused by the use of enemata.

The presentation of both papers showed the general unanimity of opinion regarding the manner in which patients were prepared for operation in this city and treated after operation. He thought it was simplicity that had taken the place of complexity. They had discovered that patients did better when left alone than when they were tinkered with.

DR. MALCOLM MCLEAN for many years had made use of iodine and had asked that it be used by others for purposes mentioned in the papers. He had even talked of its value before the New York Obstetrical Society for fifteen years.

What he wished particularly to know was, what kind of iodine were they using? Dr. Healy had spoken of a 3 1/2 per cent. solution; that was definite; but Dr. Grad had spoken of the tincture of iodine, which was indefinite. The compound tincture was of great value because miscible with water.

DR. JOHN O. POLAK said that the papers were highly instructive, as they had brought out the routine preparation of patients for operation at two representative hospitals. There was little to be said or to criticise. However, in Dr. Healy's paper, two points were mentioned which were so at variance with his habit, that he would like to take exception. One Dr. Brickner had already alluded to; why withdraw a vaginal gauze drain on the third day? They were in the habit of leaving in gauze drainage rolls seven, eight or ten days, then taking out the center roll as the temperature began to rise after the usual drop.

Dr. Healy had also mentioned irrigating the abscess cavities, a most dangerous procedure. Dr. Polak had never done this since he had lost a patient years ago, where autopsy proved that the irrigating fluid had entered the general peritoneal sac. If gauze was left in long enough, the pelvic peritoneal cavity would be isolated from the greater cavity.

He had one suggestion to make which had proven valuable to him in ridding the patient of gas in those cases where simple enemata did not do the work, and this was the use of colonic irrigations with the patient in the Trendelenberg posture, using the double current catheter and several gallons of saline. By this method he had never failed to relieve the distention.

Too much attention could not be paid to the care of the nasopharynx prior to operations in which an anesthetic was re-

quired. Dr. Grad had called attention to the nasopharynx, but he had said nothing regarding the preparation of it before the administration of the anesthetic. This was a very important matter. Many of the postoperative pneumonias were due to neglect of conditions existing in the nasopharynx prior to the administration of the anesthetic. If proper attention was given to the nasopharynx, the patient would take the anesthetic better, there would be less mucus, and there would be much less difficulty in the administration.

With regard to the preparation of the bowels before operation, too much catharsis was not necessary. Since he had done upper abdominal surgery, he had come to the conclusion that the less we do to the bowels the better the patients do. It was their habit at the hospital to give one high and one low enema, but they did not disturb patients at 5.30 in the morning.

Many patients complained of thirst after operation and Dr. Polak said that he had found that chewing gum was very effective in relieving this symptom.

DR. RALPH H. POMEROY asked Dr. Grad what difference there was in the behavior of patients who were under the influence of hyoscine and morphine and those who were under the influence of morphine and a small amount of atropine. The latter had found favor as a preliminary treatment of these patients who were about to be anesthetized.

DR. EVERETT M. HAWKS had had considerable experience in anesthetizing patients who had been given hyoscine and morphine and had watched the effects with much interest. He was glad to testify to what Dr. Grad had stated as to its advantages and would add a few words about the objectionable features.

The chief advantage lay in the removal of the patient's anxiety and fear before coming to the anesthetizing room. As a rule, the patient is passive, drowsy, or in a sound sleep. This effect is more marked than when morphine and atropine are used. The onset of anesthesia is quiet and easy and it is a pleasure to give the anesthetic to these cases. There is no mucus as a rule. Less anesthetic is required—surprisingly little in case not requiring deep narcosis. The recovery is generally quiet—sleep for two or three hours being the rule. They are free from the immediate sharp postoperative pain, and on this account seem to suffer less shock. The quiet onset of anesthesia in the drowsy state with the peaceful recovery make a happy picture and frequently patients are seen in the wards who recall nothing of the anesthetic and who will not believe that they have been operated upon until they see the incision.

The most objectionable feature is the depression of respiration. Extreme cyanosis and even suspension of respiration may occur at the onset of anesthesia if nitrous oxid or ether are pushed too rapidly. The condition is easily remedied by ordinary simple measures but if respiration ceases, or nearly ceases during the operation on account of too deep narcosis it is difficult to re-

establish it as there is the drug plus the ether to overcome. This condition is a positive danger and must be guarded against by the closest attention on the part of the anesthetist. During the induction of anesthesia if the patient's respirations are as low as fifteen to the minute and she is in a stupor it is better to start with chloroform and ether by drop method. Another objection arises often during an abdominal operation when muscular relaxation is essential. The anesthetist may be deceived as to the depth of the narcosis by the quiet breathing and allow his patient suddenly to come well out and strain—quite an uneven anesthesia resulting.

Dr. Hawks said that his attitude toward the use of hyoscine and morphine had changed from one of fear and prejudice to one of decided favor. It is a complicated anesthetic, however, requiring experience and close attention in its use and under these conditions it is both technically desirable and humane.

DR. ROBERT L. DICKINSON thought they were all working toward the same ideas; however, he ventured to take issue with Dr. Grad about the time between the announcement to the patient that an operation was necessary and the time of operation. This time he made as short as possible. He did not believe in holding patients in the wards days or weeks before operating, as done abroad; the American woman was differently constituted. Dr. Dickinson gave forty-eight hours' notice of an operation. The patients should spend one night at home and one night in the hospital if this was possible. Of course, the surgeon might tell the husband or friends earlier than an operation was to be performed.

He said it was good to note the abolition of wet dressings, and of the catheter before operations. Between the time the catheter was used in a patient's room and the time for operation the bladder filled up again. The patient should urinate when about to leave the room; if at the moment for operation the bladder was found filled, then the catheter might be used. As a routine at Brooklyn Hospital, the last step of preparation in the operating-room was the catheter.

After operations the patients should be encouraged to move about; this lessened the possibility of exudates and adhesions. Six hours after laparotomy, rolling or leg action was encouraged. They had studied these postoperative exudates, mapped them out in the interior diagrams after laparotomies, and the conclusion had been arrived at that not only was early exercise necessary, but late exercise as well. Excluding rare and considerable edema of adhesions, in the ordinary case the simplest form of active exercise was that lying in bed or sitting in a chair as follows:

EXERCISES FOR M.

I. *Lying on the back*, with hands behind the neck and elbows resting on the bed, and breathing deeply.

1. Bend right knee to upright, extend knee and carry slowly to level three to ten times.

2. Bend left knee to the chest, extend knee and carry slowly to the level three to ten times. (After two or three weeks, add.)

3. Bend both knees to the chest and extend slowly to the floor, five to ten times.

II. *Sitting on straight high-backed chair*, with hands holding at the top of the back of the chair, and holding the abdomen well in.

1. Bend right knee as high as possible to the chest five to ten times.

2. Bend left knee as high as possible to the chest, five to ten times.

3. Arm raising sideways upward to over head, with slow deep breathing, arm sinking sideways downward, letting out the breath, but still holding the abdomen well in, twenty to fifty times. (After two or three weeks, add.)

4. Bend both knees as high as possible to the chest, five to ten times.

One paid too little to patients after they left the hospital. Dr. Dickinson submitted this card of instructions which was given to gynecological patients leaving Brooklyn hospital.

INSTRUCTIONS ON LEAVING HOSPITAL AFTER OPERATION.

Date of Discharge,

The operation was

Counting from day of return home, you should do as follows: Stay in bed days. May use stairs after days, weeks: Avoid corset pressure, tight waist bands and heavy skirts for weeks. For warmth use heavy underclothing or equestrian tights. Under certain conditions a correct corset is important.

Be sure that bowels move daily. Go at same hour every day. Try black coffee taken on waking and none at breakfast. If medicine fails, use soap-sud injection. Avoid straining. Take a vaginal douche daily for weeks. Lie upon back and use as many quarts as syringe will hold of water hot as hand will bear, a tablespoonful of borax to each quart.

You need watching. Report to your physician regularly. If sent to hospital from dispensary return there in days weeks. If things do not go right notify your physician (or the hospital) by telephone or letter. The first and second periods may be somewhat excessive and painful; at both periods stay in bed or on couch two days. Light work in weeks; heavy work in weeks. Do not be discouraged if your strength returns slowly or if there is some tenderness and pain for a time. You may need a tonic. These directions fit your present condition. They may require changing to meet a change in conditions. Don't hesitate to ask.

Instructions were also given as to diet in order to overcome the sluggishness likely to develop into a habit after operation; as, for example, in persons with good digestion.

DIET LIST NO. 7.

Breakfast.—Orange or grape fruit, apples or grapes; coarse oatmeal; cream and sugar; several slices of whole wheat bread; salt fish or eggs and bacon.

Midday.—Moderate portion of meat or fish, fresh or salt; two vegetables such as spinnach, cauliflower, cabbage, sprouts, green beans, corn, peas, carrots, egg plant, onions; celery and lettuce with each meal; fruit, fresh or cooked.

Supper.—About as at noon. No objection to olives, sweet pickles and the like. With each meal several slices of whole wheat bread; butter in liberal amounts; salads with oil and vinegar. No particular restrictions as to drinks; buttermilk, plain milk, cocoa, coffee or beer. Two teaspoonsful of agar are to be added to some food twice daily. This is to be sprinkled on food and mixed with it and allowed to soften for a few minutes before eating. Agar is taken most easily on cereal, in apple-sauce or made with a cooked white sauce flavored to taste. It is more easily taken if it is not allowed to swell too much before eating.

All these cards were of standard size.

DISCUSSION.

DR. LE ROY BROWN said: I have not used the combination of hyoscine and morphine before the administration of an anesthetic, being uncertain as to the extent of depression following the hyoscine. I am aware, however, of the close observation under which Dr. Grad kept his patients, before and after operation, and am equally aware of how Dr. Hawks noted symptoms, and the results associated with, and following the administration of the anesthetic. With this knowledge as to the scientific and close observation of both of these men, I feel that what was said should be given serious consideration.

With reference to the preparation and after-care of patients in operations, I wish to mention a custom of mine that has not been spoken of to-night. I refer to placing the patient in the extreme Trendelenburg position, after every abdominal section, and giving her two quarts of saline solution by rectum. The object of this injection, and position, is to mechanically throw the transverse colon back to the normal place. Not infrequently we find, on opening the abdomen, that the transverse colon is prolapsed, and will extend below the umbilicus if the abdomen is closed. The adhesions between the omentum and the surrounding parts which are sure to follow will fix the colon in this position, and give a permanent ptosis with the resulting symptoms, all of which are at times worse than the symptoms from the original

trouble. This can be avoided by following out the procedure that I have spoken of. We also get the benefit of the allayed thirst of the patient.

DR. DOUGAL BISSELL said that any one doing abdominal sections was constantly confronted with the question of nausea and vomiting, and he referred to a case which had been most interesting and instructive to him in the management of this particularly disagreeable feature of surgical work. On a visit to the South several years ago one of a group of patients upon whom he there operated, suffered severely from vomiting immediately after operation. On his second visit he found that the distressing symptoms had completely subsided, and on inquiring of the attending physician what remedial agent if any had been used was told, much to his surprise, that cold ginger ale had been given. It was discovered to be the habitual remedy for nausea and vomiting after surgical work in that section. He has been using it ever since and finds it most acceptable to the majority of his patients for at least twenty-four hours, and frequently completely allays their vomiting; a little whiskey or lemon juice is sometimes added to advantage.

In cases where the colon, especially the sigmoid flexure, was badly damaged during intraabdominal operative work, instead of using the Trendelenburg posture and colon irrigation for the relief of distention, he suggested the use of a long rectal tube passed into the bowel as high as the middle of the descending colon, there retained for several days by adhesive plaster attached to the outer end of the tube and the buttock. He related a case of double adnexal disease involving the sigmoid where the muscular coat of that portion of the intestine was completely stripped off for its entire length. As neither the general nor local condition would have permitted a resection, it was decided to insert and secure in position a rectal tube, twenty inches in length, that the canal might be kept patent. The other end of the tube was connected with another tube, and this inserted in a bottle of water, through which the gases and bowel contents could be seen to escape. Sweet oil and water were injected through the tube directly into the colon without occasioning distress. The bowels tolerated the presence of the tube for more than a week and the patient's convalescence was most comfortable.

DR. C. G. CHILD, JR., wished to commend many of the points that each of the readers of the papers had taken up. With regard to catharsis before operation, however, he believed that as little as possible was desirable and if this rule was followed the bowels moved more frequently with less distress and sooner after operation. If a patient's bowels had not been moving regularly, and if they were in the habit of taking a cathartic, it was his custom to find out what cathartic they were accustomed to take, and to use that.

With regard to the preparation of the field of operation, this he thought should be simplified as much as possible and carried

out before the patient came to the operating-room. For many years he had objected to scrubbing patients when on the operating-table, because he did not think that it was necessary and because it prolonged the anesthetic. Nor was it necessary, or desirable in his opinion, when a patient was on the table and under the depressing effect of an anesthetic that she should lie in wet poultices from head to foot throughout the operation. It seemed as if there was some connection between this treatment and postoperative pneumonia. During the past six years he had not had a case of postoperative pneumonia.

The object in the preparation of the area of operation was presumably to acquire a sterile field, but he was not convinced that the extensive cleansing of the skin advocated by the writers was necessary. Postoperative infections of the wound he thought were in most cases due to a defective technic of the operator, and not to errors of omission or commission in the preparation of the patients. He depended upon a careful scrubbing with the tincture of green soap, water, Stewart's solution and a dry dressing carried out the day before operation and repeated. Whatever was done should be done before the patient was on the table, the day before or an hour before the time of operation. He did not use iodine or a preliminary "souse" of a 1-10,000 bichloride solution just before operation, as he believed the former a fad, and the latter a relic of the middle ages of surgery.

Neither of the essayists had given statistics as to the behavior of their wounds after operation. Presumably there should be some connection between the method of preparation used and the percentage of primary unions. In his last 100 cases of abdominal section the percentage of cases in which primary union occurred was 96 per cent.; in other words, there were but four cases which did not heal by primary union. In one of these cases the patient infected the wound by placing her fingers under the dressings. In the second case there occurred a serum accumulation under the skin on the second day following the operation. In the third case there was a streptococcic infection. In the fourth case there was a mild infection. Among the 100 cases eighteen were septic at the time of operation, and in them the percentage of primary union was 89. He said he would be glad to hear just what Dr. Healy's and Dr. Grad's percentages were.

With regard to catheterization after operation he believed six or eight hours was too short a time.

He advised against catheterizing these patients under twelve hours. He desired distention of the bladder after these operations; this distention of the bladder pushed the intestines and omentum away from the transverse abdominal incision which he used and tended to prevent the formation of adhesions to the peritoneal scar.

With regard to the time spent in bed, he advised these patients to be up and about as soon as possible after operation. He

wished them up on the fourth or fifth day if possible. They should be up and around three or four hours a day. If they became tired, let them go back to bed. They left the hospital, as a rule, by the end of the second week. He thought that Dr. Healy's practice of keeping uncomplicated cases in bed for fifteen or more days after abdominal section, sometimes even for three weeks, was to be discouraged, for after one week in bed they lost strength rapidly, and the convalescence was greatly protracted.

DR. HOWARD C. TAYLOR, closing the discussion for Dr. Healy, said that the technic described was practically that used by him on his service at the Roosevelt Hospital.

Regarding the early removal of gauze drains, he stated that he used drainage practically in two classes of cases. One class consisted of those abdominal operations in which more or less necrotic tissue was left behind. Here a single strand of packing or a cigarette drain into the vagina was used. At the end of two or three days this area of necrotic tissue would be shut off from the peritoneal cavity and the drainage tract from it to the vagina established and the drain can be removed. This tract will close as soon as the necessity for drainage is past. The other class of cases consists of the cases where an abscess in the pelvis is drained through the vagina without opening the abdomen. In these cases the drain is used to establish the drainage tract and not to pack the abscess cavity. The abscess cavity will contract rapidly in the first few days after it has been opened if it is not kept distended with gauze. The gauze in these cases is removed within two or three days, and the tract kept open with a dilator if necessary. In short, it is his custom to use only a small amount of gauze, rarely more than 6 inches, and remove it all by the third day. It is his custom to wash out pelvic abscess cases with a solution under low pressure and he has had no trouble in doing so.

Dr. Taylor has used iodine in the preparation of the skin during the past two years and is satisfied with the results. He uses a 3.5 per cent. solution of iodine and considers two coats sufficient; one coat should be applied three or four hours previous to the operation and the other on the table. The use of iodine in the preparation of the skin is more comfortable to the patient than any form of wet dressing or soap poultice. On the operating-table, the advantages were the saving of time and the avoidance of wetting the patient, two factors of importance. He had had no trouble with overirritation of the skin with the use of two coats of a 3.5 per cent. solution of iodine. One surgeon of his acquaintance was unable to use this method of the preparation of the skin on account of the irritation of his own mucous membranes produced by the iodine.

Regarding the use of cathartics previous to operations, there are two things to be considered: one, the discomfort and disturbance of the patient caused by the use of a cathartic; the other,

the possibility of distention of the intestines and the trouble from it during the operation. If the intestines are distended they will have to be handled more than if well emptied and this itself will cause postoperative discomfort. The best plan when there is time, is to have the bowels well emptied a few days previous to operation and this followed by a limited diet.

Dr. Taylor has not used hyoscine and morphine previous to the anesthetic. The actual discomfort from nitrous oxide and ether is not great. Their use over many years have proved them to be associated with very little risk. It is his belief that the increased comfort to the patient afforded by the use of hyoscine and morphine does not counterbalance the increased risk.

His patients are not catheterized unless they are unable to pass their urine themselves. Even on the operating table the catheter is not passed as a routine, but only if there is a suggestion of a full bladder. There is less danger of infection of a perineal wound from urine passing over it than there is of infection of the bladder from catheterization.

Dr. HERMAN GRAD closed the discussion. In answer to Dr. Brickner's question if he had ever met with disastrous or fatal effects from the use of scopolamine and morphine, he answered that he had never witnessed any ill effects from the employment of small therapeutic doses. With regard to the use of calomel he said it was given to patients who were accustomed to take this drug and who were not disturbed by it. It was not given with any idea of its therapeutic effect on syphilis.

In regard to the tincture of iodine they used the official preparation which was about 7 per cent. Only one coat was applied.

With regard to the nasopharynx he had much more to say regarding it, but time did not permit him to read it. If there were any abrasions present he was very careful to touch them with some mild antiseptic solution. The mouth and accessory cavities were cleansed with a wash and hydrogen dioxide. They took particular care of the nasopharynx of patients who were about to undergo operation.

As to using morphine and atropine instead of hyoscine and morphine, it is because the latter was more of a cerebral sedative and that was what he was after.

Dr. Hawks spoke of certain objections to the use of hyoscine and morphine; Dr. Grad said there were objections. If it was difficult for the anesthetist to know how deep the narcosis was, that of course was a disadvantage, but it is up to the anesthetist to be careful not to push the gas or ether too much in these cases. He must discriminate. If the patient's respirations become as low as fifteen or lower he should go slowly with the anesthetic. The anesthetist must closely observe his case; the method should not be employed by anyone who was not familiar with it. Given a man who had been trained and who was a close observer, he would have no trouble in anesthetizing these patients who had

received an injection of hyoscine and morphine. The patients would be brought to the operating room fully relaxed. The anesthetic should not be pushed too rapidly.

Dr. Dickinson said not to tell the patient that she was to be operated on more than forty-eight hours before operating. Dr. Grad thought that they should make their patients understand just what they wished to accomplish; make it clear to them what the operation was intended to accomplish. An intelligent woman would grasp the situation and her fear would be overcome to a certain extent.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of December 28, 1911.

FRANKLIN A. DORMAN, M. D., *Chairman pro tem.*

OMENTAL ADHESIONS FOLLOWING OPERATION WITH NAUSEA FOR TWO YEARS.

DR. LE ROY BROWN reported the case of a stenographer, twenty-seven years old, who was sent to him by Dr. Wildman with the following history. Four years before seeing her she had had an abdominal operation for retroversion of the uterus. For the first two years the patient stated that she had been, at frequent intervals, vomiting after each meal; at times this condition continued for months. During this time, and especially since the first of May, she had had constant pain over the stomach; the quantity of food taken apparently made no difference concerning her ability to retain it. Her former weight was 160 pounds; she now weighed 130. She was admitted to the hospital on September 26, 1911, and was kept under observation for a week before operation when it was found that her statements were correct and that she had not retained her meals. An incision was made over the stomach thinking that possibly some gastric condition was present; the stomach and duodenum were carefully examined and no evidence of an old scar or other abnormalities was present; the stomach, however, was displaced downward. The transverse colon was pulled below the umbilicus by several dense bands of adhesions of the omentum to the abdominal wall. No other abnormalities were recognized. These bands were severed and the omentum was quilted and stitched to the abdominal wall above the umbilicus; the appendix was removed although it did not show anything abnormal. The after-history was most gratifying; the patient ceased to

vomit, improved in weight and was relieved of all her epigastric pain.

It should be born in mind that the movable parts of the colon are the cecum, the transverse colon and the sigmoid. The omental adhesions had fixed the transverse colon in a vicious ptosis; this in turn had pulled upon the stomach and had also undoubtedly caused pressure through its mesentery and the superior mesenteric artery on the underlying duodenum, starting up the stomach disturbance of which she complained for such a length of time. Since Dr. Broun's attention had been called to omental adhesions and their influence on the transverse colon and stomach, he had made a uniform practice, at the close of every operation, of placing the patient in the extreme Trendelenberg position and giving two quarts of salt solution by rectum. This would act mechanically and, by its own weight, throw the transverse colon back to its normal position, preventing abnormal fixations.

RESECTION OF REDUNDANT SIGMOID.

DR. BROUN said that in the preceding case they had symptoms resulting from an acquired ptosis as the result of adhesions. This case was one of defective development with the resulting pathological conditions, and intercurring symptoms. The patient was an unmarried woman, twenty years old, very near-sighted, and with all the symptoms attending a pronounced neurasthenic; she was constipated, had hemorrhoids and pain in the back. The local condition was one of retroversion of the uterus and hemorrhoids. The uterus was replaced by shortening the round ligaments through a small transverse incision; this was done on September 28, 1911. The appendix was also removed. The entire pelvis was occupied by a redundant sigmoid, so much so as to interfere materially with the operation; the redundant portion was much dilated and congested. The sigmoid was fastened to the abdominal wall in the hopes that some of her symptoms might be relieved. The resection was not done on account of not having spoken to the patient about such an operation. Before being discharged from the hospital she was told of her condition and advised if her symptoms were not relieved she should reenter the hospital for further operative measures. The patient was sent to a recuperative home. From there she obtained several positions none of which she could hold on account of her general nervous condition. She reentered the hospital on December 12, 1911, and a resection of 8 inches of redundant sigmoid was done. The attachment of the redundant sigmoid to the abdominal wall had improved the condition materially. It was less distended and less congested. After resection of the sigmoid the transverse colon was suspended by its quilted omentum to the abdominal wall. The patient made an uninterrupted recovery and now was ready to be discharged from the hospital.

Dr. Broun believed with Clark that such operations should only be done as a last resort, and then without any absolute assurance of the relief from symptoms. These were a class of cases, however, that they met with in the hospitals and it was difficult to carry out any conservative treatment. He was referring to such a class of cases who were forced back to work for their daily bread, and who could not rest, or be subjected to long lines of medical treatment. This patient had been under treatment for some months before she first entered the hospital. All knew that the treatment usually given such patients in dispensaries must necessarily be limited.

SQUAMOUS EPITHELIOMA OF THE CERVIX ASSOCIATED WITH
TUBERCULOUS PERITONITIS.

DR. BROUN reported this case. The patient, thirty years old, was sent to him by Dr. Swan on October 27, 1911. She had been married twice. Her first husband lived seven years and by this marriage she had two children, the first still-born, the second a normal labor. Since the birth of her first child her health had not been good. Her menstruation had been profuse for the first week, and then somewhat scanty for fifteen days. There was hardly any interval between one period and another. This had continued for some time. She had been curetted twice, but not during the last four years. The general condition of the patient when seen was one of intense nervousness and anxiety. The cervix was diseased and strongly suggested cancer. She was sent to the hospital for immediate operation.

During the previous three years, during her second marriage, she was practically an invalid. On October 30, under anesthesia, the cervix was exposed and had every appearance of epithelioma. On the right side the erosion extended beyond the cervicovaginal junction. The indication was that of radical operation for cancer. The fact of her second marriage, the youth of the patient, and her anxiety to be the wife to the present husband made them hesitate to take away all future hope of maternity.

Large sections were taken from the parts most involved and sent to the laboratory for a report on frozen sections; a number were examined and the report was that they were free from carcinoma. On the basis of this microscopical examination and diagnosis a high amputation was done; the excised portion was examined in the regular way. The report was returned as squamous-celled epithelioma. This diagnosis was verified by Dr. Cullen of Baltimore to whom the slides and specimen were sent. A radical operation was suggested and done at once, ten days after the first operation. The operation was peculiarly difficult in that both ureters were imbedded in the inflammatory exudate. It was necessary to dissect each from the surrounding exudate resulting from the recent operation for the excision of the cervix which extended beyond the cervicovaginal junction on each side. Enlarged pelvic glands were searched for but none were found.

At the time of the removal of the uterus, by cutting away the vagina below the occluding clamps, it was found that all of the involved part of the vagina on the right side had not been removed. The involved portion left behind was removed at once. The pathologist's report stated that the right lateral portion was involved up to the line of the cervix; this was recognized at the time of the removal. The examination of the vaginal portion removed from the right side showed that no involved tissue was left behind.

The recovery of the patient was uneventful with the exception of a prolonged inability to empty the bladder, a condition which appeared to be not uncommon after this operation. This was explained by Wertheim from the extensive removal of the vagina and the exposure of the base of the bladder. Both Fallopian tubes were moderately adherent and gave evidences of a mild salpingitis. The pathologist's findings of a tuberculous salpingitis was unexpected. Such a coincident occurring was unusual and deserved special note.

LARGE BILATERAL BARTHOLIN CYSTS.*

DR. S. WIENER reported this case.

DR. S. MARKS reported a case of

LABOR WITH BIRTH SIMULTANEOUSLY THROUGH THE RECTUM AND THROUGH THE VAGINA.

The child was not born through a central laceration of the perineum. He was called in consultation to see a woman, thirty years of age, who had been in labor eight or ten hours. The os admitted two fingers and the head was in the first position. He told the physician that it was better to wait and if it was necessary to send for him again. This was at 8 A. M. At 3 P. M. the woman's pulse was 110 and the os was fully dilated. Axis traction was made and he thought he could easily deliver the child. The head was in the pelvic basin. Upon making traction he noticed the anus increasing in size, soon attaining the diameter of four inches and then he found that the arm and shoulder were slipping through the anus while the head was emerging at the vulva. He then cut through the tissues separating the vagina from the anus and delivered the child naturally and readily. He found a tear in the rectum about 3 1/2 inches long; this he sewed up without any difficulty and there was good union after ten or twelve days. What caused the tear he could not say unless it was pressure. The forceps did not cause it because the traction was downward. He did not know whether there had been recorded another such a case, a simultaneous birth of the baby through the anus and vagina at the same time.

*For original article, see page 243.

DISCUSSION.

DR. A. J. RONGY thought the case of Dr. Marks very interesting. There were very few cases of this nature reported in the literature. He had seen a woman deliver herself through the rectum spontaneously. The vaginal orifice was left intact. This case illustrated very well Klein's conception of the principles governing the pelvic outlet and also perineal lacerations.

Klein divided the outlet by drawing an imaginary transverse line between the tuber ischii, dividing the pelvic outlet into the anterior and posterior segments. The posterior was the larger of the two. Now in cases in which the pelvic arch was narrow, flat, and left no room for the head to engage itself in the anterior segment, it naturally had to be born at the expense of the posterior segment. When this deformity of the pubic arch is extreme, the greatest part of the head engaging itself behind this transverse line, rupture of the perineum was likely to take place at its weakest portion, and with it the rectum, and the head would be born through this artificial opening. On the other hand, if the anterior was roomy and the pubic arch well formed, the greater part of the head would be born at the expense of the anterior segment and therefore the perineum was not likely to be lacerated. He was sure that in Dr. Marks's case as well as in the cases he had seen the pubic arch must have been in the condition described above.

PUBIOTOMY: A REPORT OF TEN CASES AND A REVIEW OF ITS HISTORY IN AMERICA.

DR. SIDNEY D. JACOBSON said that pubiotomy, also known as hebosteotomy, was the method of delivering a woman by dividing her pubic bone with a saw. It differed from symphysiotomy in which the ligaments which held the pubic bones together were cut with a knife. The operation was proposed by Gigli in 1894 but first successfully performed by Bonardi in 1897. The necessity for some such procedure must have been felt long ago for in 1821 Champion had suggested the performance of "lateral pelviotomy." The first case of this kind performed in the United States was done by Dr. Montgomery in Quincy, Ill., the occasion being a persistent face presentation with the chin posteriorly. Attempted symphysiotomy having failed, the doctor used a metacarpal saw and accidentally divided the pubic bone to one side of the joint. The operation had been performed fifty-three times in this country by twenty operators in six different states. Of these operations twenty-three were performed in New York, twenty-three in Baltimore, two in Baltimore, two in Washington, one in Chicago, one in Philadelphia, one in Bowling Green and one in Quincy, Ill. There were thirty-nine primary or elective, and fourteen secondary pubiotomies, meaning by that case in which attempts at delivery by forceps or otherwise had been made previous to the operation. Of the thirty-nine primary operations

all the mothers, or 100 per cent. remained alive, while thirty-six babies or over 90 per cent. remained alive over one week. These figures make an eloquent plea for the performance of pubiotomy in cases of moderately contracted pelvis. With any other form of treatment in these secondary cases practically all of the children and most of the mothers would probably have been lost. In his early experience with the operation of pubiotomy as ordinarily done Dr. Jacobson had been impressed with two drawbacks. The first was that after the bone section merely a thin bridge of skin and fat lay between the operator and the divided tissue. This bridge was of no value to the patient and prevented the surgeon from being able to use proper surgical methods to stop hemorrhage, which was sometimes serious. A second drawback was that under this bridge of skin a hematoma often formed which might become infected and cause tedious suppuration and sepsis. The writer therefore used the open method by dissecting down to the bone before dividing it. Thus all hemorrhage could be easily controlled. Another modification was that the writer operated with the patient on her back and her legs extended. Thus intraabdominal pressure was not raised and the baby's head was not forcibly jammed down into her pelvis the moment the bone section was completed and the ends of the divided bone were not violently pried apart. Thus extensive vaginal lacerations were avoided.

The technic as practised by the writer was simple and ought to be within the compass of any one claiming recognition as an obstetric surgeon. Briefly it was as follows: The patient's pubic region was submitted to a dry shave and her vulva and the adjacent parts were painted with tincture of iodine. If she had a purulent vaginal discharge, the interior of the vagina was also painted with iodine. Being anesthetized the patient was placed on the operating table upon her back with her legs extended and somewhat separated. The operator stood at her left. He found the left pubic spine by palpation and made an incision about four inches long just median to the spine and almost parallel with the left labium majus. The incision was made longer if the patient was fat. This incision was deepened until the whole pubic bone came into view; meanwhile a few small blood vessels would have to be clamped. The saw carrier was passed around the back of the bone keeping close to its posterior surface, from above downward, until the lower end of the pubic bone was reached. The carrier was passed just median to the pubic spine. When the point of the carrier had emerged into the wound under the lower edge of the bone, the saw was attached to its eye by a stout thread and the carrier being withdrawn pulled the saw up behind the bone with it. The carrier was detached and the handles of the saw adjusted; then, by the aid of sight, the bone was sawn through from behind forward.

As the bone section was completed, the saw slipped out of the wound and was discarded and a sterile gauze packing was firmly

pushed behind the cut ends of the bone, between its cut surfaces and in front of it till the wound was full. This stopped all bleeding. The lips of the wound were brought together with from 4 to 6 silkworm or Pagenstacher sutures and tied with bow knots. The patient was then slowly brought into the lithotomy position, care being taken not to evert her toes much as this separated the bone ends and tore the soft parts. Forceps were then applied and the baby delivered with ease. The cord was clamped and cut; the placenta delivered and the uterus and vagina packed with sterile gauze to prevent the possibility of postpartum hemorrhage which it would be rather difficult to treat because of the newly divided pelvis. A little roll of sterile gauze was placed over the line of the incision and a 3-inch wide strip of adhesive plaster placed over that to keep out discharges.

The urine was drawn by catheter and if without a mixture with blood the bladder was uninjured. About twelve hours later the dressing was removed. The bow-knots of the sutures were untied but the sutures left in place; the packing was removed and the sutures tied in surgical knots bringing the lips of the wound into apposition. Gauze and plaster dressing were applied after leaving a small gauze drain in the lower angle of the incision. This drain and dressing were changed daily and the stitches were removed on the sixth day.

The uterine and vaginal packing were removed and the patient was ordered catheterized every five hours for the first week; otherwise the treatment was the same as after instrumental delivery. The patient was permitted to move at will from the start and could usually get up in two and one-half to three weeks.

The writer gave a brief résumé of his ten cases which showed 100 per cent. of recoveries among the mothers and 70 per cent. among the babies. Of the others two died of throat infection ten days later and the third died from an unknown cause at the age of four weeks. Two patients out of this series delivered themselves without assistance each about one year after her pubiotomy and they and their children are alive.

The indications for pubiotomy obtain in all cases of moderately contracted pelvis and it enters into competition with the following methods: induction of labor between seven and one-half and eight months; Cesarean section; version; high forceps and craniotomy on the living child and symphysiotomy. It is far better than induction of labor in the interest of the child because it gives incomparably better results. In the induction of premature labor Winckel gives the maternal mortality as 5 per cent., and the fetal mortality as 33 per cent. Pubiotomy is far preferable to Cesarean section in moderate degrees of pelvic contraction, because the patient can be given the test of labor. It is said to be almost impossible to measure exactly the pelvis and this only takes into account one factor while there are three concerned in the birth of the child, the size and shape of the birth canal, the size and hardness of the child's head, and the muscular power of the

mother. If the woman is not given the test of labor unnecessary Cesarean sections might be performed. If a sufficient test of labor be given the mother, Cesarean section becomes too dangerous. Cesarean section in these cases because it attacked an unoffending organ, it did not cure the cause of the trouble, and left the patient with the prospect of having to be sterilized, or having to submit to further section with each succeeding pregnancy. A laparotomy was no small matter as it left the patient with a scar in the abdomen and in the uterus which might prove a menace to life in a future pregnancy. The mortality of Cesarean section was still in the neighborhood of 5 per cent., which was much higher than that of pubiotomy. Version in contracted pelvis ought not to be considered, unless the fetus was exceptionally small or under the special protection of Divinity, it would surely be lost. The high forceps operation had rightly been called an abomination. The proper place for the high forceps was on the scrap heap. The high forceps operation with the head above the pelvic brim ought to be forbidden by law. It might be said to the undying merit of pubiotomy that it had made that reproach to modern obstetrics, craniotomy on the living child unnecessary. This slaughter of the innocent was now unjustifiable under any condition. Symphysiotomy was now almost obsolete; it had shown a mortality of 10 per cent. and a morbidity of 30 per cent. The patients were liable to become septic and develop abscess, fistula, incontinence of urine, paresis of the bladder, hematoma, etc. It should no longer be practised.

Pubiotomy left no permanent disability as the pelvis remained permanently enlarged and enabled the woman to bear spontaneously the next time.

DISCUSSION.

DR. S. MARX was always suspicious of any man who reported ten cases of pubiotomy. He was not only absolutely opposed to this operation but to symphysiotomy as well. There was a large mortality rate after symphysiotomy whether the operation was elective or not. He felt that he could guarantee, or almost guarantee, that an expert could do 100 Cesarean sections on these patients without mortality and the women would be left in good condition. On the other hand, take a case of elective pubiotomy, if there was such a thing, even in the hands of such an expert as Dr. Jacobson, they would not get 100 per cent. recoveries and the women would not be left in good condition. He had seen women injured for life, hopeless cripples, with tremendous fistulæ and who walked as though going up step-ladders, all the result of pubiotomy. Dr. Marx said that he went abroad every year and he made inquiries regarding the results of pubiotomy. The first hospital he visited contained three women who were reported as cured after this operation. One had a hole in her bladder; the second had not walked for

six or seven weeks; the third had a permanent urethral fistula. He asked: "Are these cases reported as cures?" and the answer was: "Yes." This made one think twice. He had never seen the wonderful results that Dr. Jacobson had seen. He had seen temperatures develop, necrosis of bone, sepsis, hematoma, and other conditions of serious import follow this operation. Dr. Marx asked that they compare these results with those that followed a good, clean elective or nonelective operation of Cesarean section. In reading the report of Dr. Davis on the results of Cesarean section on women under all conditions there was recorded a mortality rate of 14 per cent.; many of these women were infected, came from the slums and from dirty tenement houses, etc. The cases reported by Humpstone showed not a single death. And of his own patients, twenty-five in number, all recovered except one, who was operated during an acute pneumonia.

As to the operation, the description Dr. Jacobson gave of the cases was not full enough to satisfy Dr. Marx. He spoke of women with contracted pelves, of women with small pelves, etc., but nothing was said about the position or the adaptability, etc. Dr. Marx said he cared not what the pelvis measured but he did care about the irregularities. If they could get the head to engage it would go through. Many a time had he been called in consultation and told that the woman must be delivered at once, because of a contracted pelvis; upon examination he would find a normal pelvis but in some cases a mal-position. One case was reported by Jacobson from Illinois of a symphysiotomy performed because the child's head was mentoposterior. Did he try to correct that position? The reason pubiotomy could not be made an elective operation was because the patients were not seen early enough, and because of its narrow limitations. When they met with a head above the pelvic brim that did not engage, 2 1/2 inches was elective for Cesarean section; from 2 1/2 to 3 3/4 would bring up the possibility of what might be called elective pubiotomy. In those cases in which the suspicion arises that a pubiotomy might be required he advised the Walcher position; with the head in the pelvis he applied the forceps. When the waters had escaped it might be well to attempt an elective high forceps, but all in the Walcher position. In those cases where the child was dying or dead there offered a tremendous and useful field for perforation and he used the perforator to-day more than ever before. However, Dr. Marx still maintained that to-day the best results were obtained by doing a clean Cesarean section. What was the morbidity rate? He did not care so much about the mortality rate; it was the morbidity rate which counted so much. Many women would rather be dead than suffer as so many have suffered after these operations.

Dr. JOHN O. POLAK said that the time had come in obstetric surgery when delivery of the full term living child at term in

contracted pelvis must be made by forceps, pubiotomy or Cesarean section. The forceps should be used only in patients who have had the test of labor and where the head can be engaged in the pelvis. If the head cannot be so engaged the question of Cesarean section or pubiotomy must be considered. Version has no place in contracted pelvis, particularly those contracted pelvis which one meets with around New York, those just-obturator pelvis. A great trouble met with in the operation of pubiotomy is the serious injury inflicted upon the soft parts. It is well enough for Dr. Jacobson and others to say, "Open the pelvis by a pubiotomy incision and the head will fall in." But the operation is not completed by the descending head; the woman must deliver herself or be delivered. Sometimes after pubic section she is capable of delivering herself, but more frequently she is not and forceps have to be applied. The operation of pubiotomy does not finish the delivery and that after this operation the woman is subjected to the same injuries that are attendants upon a difficult forceps operation, and these injuries were serious injuries so far as her subsequent comfort was concerned.

With regard to the selected Cesarean section he thought that perhaps he was too enthusiastic, as Dr. Humpstone, and himself have operated on sixty-nine cases without a death. They found that the length of time that the woman was in labor made no difference in the mortality; women who had been in labor forty-eight hours got the same results as those who had been in labor only twenty-four. He thought the reason for this success was because of the rapid and the clean technic employed. The whole procedure in experienced hands was a comparatively simple one. Authorities stated that pubiotomy should not be done in generally contracted pelvis unless the conjugate was over 3 or even $3\frac{1}{4}$ inches; the field for this operation was, therefore, extremely limited.

Last year Dr. Polak had occasion to do a Cesarean section upon a woman who had been operated upon by pubiotomy by the late Dr. Jewett. He did the Cesarean section because of an exostosis at the line of the pubiotomy wound. This instance, is another side of the story, *i.e.*, that pubiotomy does not always enlarge the pelvis. Many of the difficult problems might be solved by time and the use of the forceps. Craniotomy he was opposed to and he said he was doing fewer and fewer craniotomies because he believed that the child had certain rights.

DR. A. J. RONGY said pubiotomy has a definite field in modern obstetrics. Any operation that had been performed over 500 times by some of our best operators could not be condemned, particularly by those who had had no experience with it. Up to three months ago, he did not perform this operation but of late three cases had come under his observation, in which pubiotomy was the only operation of choice.

It was never a primary operation and was never to be per-

formed unless the woman had had a strong test of labor, the cervix fully dilated or dilatable and forceps tried. If delivery by forceps was apparently impossible and if the child was still viable, pubiotomy should be performed in the interest of the child,

It should never compete with Cesarean section. In cases in which Cesarean section was indicated, pubiotomy was contraindicated and *vice versa*. Craniotomy must be eliminated from the category of modern obstetrics if the child was fully viable. They had no right to perform a craniotomy on a living child, and the mother had no choice in the matter. Personally, he would withdraw from a case if he was asked to perform a craniotomy on a living child.

The method he followed was that of Döderlein or the partially closed method. He thought the open method opened too many areas for infection, and exposed the bony surfaces unnecessarily. The bleeding could usually be controlled by compresses and packing of the vagina, and the postoperative dressings and treatment were very simple; a strip of adhesive plaster across the pelvis usually sufficed. He allowed the patient to move about in bed at the end of the third day and he let her out of bed at the end of the fifteenth day if her physical condition permitted. He found that in his cases bony union did not take place, and the reports of the various clinics showed that fibrous union was found in two-thirds of the cases. There was no permanent enlargement of the pelvis as was claimed by pubiotomists and this was proven by the large series of fifty cases from Shauta's clinic, forty-four of whom had subsequent deliveries, only three of them delivering spontaneously.

To sum up, he said, that pubiotomy should be performed only in misjudged or neglected cases.

DR. F. C. HOLDEN thought the use of the "Gigli" saw as a prophylactic measure had a great field of usefulness. Where the saw was introduced previous to doing version many children now lost in the after-coming head deliveries would be saved. The subcutaneous method should be the one employed. Dr. Holden described the method used. In one case in which he had operated on at the end of four months after the operation she was able to walk and run without any pain and difficulty. The field for this operation, however, he believed to be a very small one. While many looked upon pubiotomy as a perfectly safe operation he did not believe it compared with Cesarean section for minimum morbidity and mortality and a subsequent perfect recovery. The real field in his mind for pubiotomy was in such cases for instance as impacted chin posterior cases with the child still living.

DR. E. K. BROWN said that the operation of pubiotomy was not an operation of election, since injuries to the bladder and malunion of the pubic bones were frequent. It was not only a question of mortality of the lying-in woman but of her morbidity. What was wanted in the description of the cases of Dr. Jacobson

were the full details of measurements of the pelves of women operated upon by him and also of the measurements of the fetal heads. Dr. Jacobson should be congratulated for his good will and studies intended to bring about relief to the suffering lying-in woman.

DR. ROSALIE SLAUGHTER MORTON asked if the children were weighed in the case cited, where in a later pregnancy a second operation was unnecessary to deliver a child at full term. Was the second child smaller than the first?

Also in the series of cases reported was the union of bone after pubiotomy such that the integrity of the pelvic girdle was preserved? If such was the case the unfortunate sequela usually associated with the operation might reasonably be assumed to be due to the lack of skill on the part of the other operators.

DR. S. WIENER said that five years ago when he was in Berlin he saw many of the bad results of pubiotomy; in 1907 there were many that appeared in the large clinics. He recalled one case in particular; this patient had been operated upon by a master in the most skilful manner. It was by the subcutaneous method. There was a tremendous injury to the bladder. The assistant was blamed for not having pushed hard enough upon the heads of the femora. It required three subsequent operations to heal the resulting vesicovaginal fistula. In Germany to-day they were going back to Cesarean section and forsaking pubiotomy.

DR. CLINTON BEECHAM KNAPP said that his experience with hebotomy was limited to one case. When he first saw the case, the patient had been in labor for a good many hours; a midwife and several doctors had made repeated attempts to deliver by forceps. The fetal heart was still in good condition. The ruptured membranes and the history of previous handling excluded the thought of Cesarean; a hebotomy was done and the child came through easily with the use of forceps, but died a day or two later from cerebral hemorrhage.

The author of the paper had said that the high forceps should be consigned to the scrap heap, but he would advise him to keep his instrument for he might need it to bring the head through after the bone had been divided. He did not think the author had sufficiently considered the danger of rupturing the bladder. The indication for a hebotomy was where the mother was not strong enough or where previous handling had made the risk of infection too great for a Cesarean. In version or breech cases where there was much doubt about the delivery of the after coming head he felt it a safe procedure to place the Gigli saw.

DR. SIDNEY D. JACOBSON, closing this discussion, said he respected the opinion of Dr. Marx as coming from an obstetrician of large experience, but must differ from him in a few minor points.

He quoted a series of about fifty Cesarean sections done by someone else without any mortality. However, these were probably picked cases, and not done on patients who had been

subjected to long labors and various other attempts at delivery beforehand. Under similar circumstances, he had quoted a series of thirty-nine primary pubiotomies without any maternal mortality. However, the most brilliant results shown by pubiotomy were in cases after the patient had been in labor so long and handled so much that the advocate of Cesarean section would not dare to operate. The mortality in such cases by section would be frightful. One of the most capable and skilful New York Obstetricians has lately shown a mortality of about 14 per cent. in a long series of unpicked cases of Cesarean section, and he had at his command a large experience, a splendidly trained staff of assistants and a first class hospital organization.

As regards the hopeless crippling of women by pubiotomy, he had never yet seen one such case either in his own practice or in that of any other operator. That there were occasionally cases which suffered for some time from the effects of injury to the soft parts due to the pressure effects of exceedingly prolonged labor, or the gouging with the forceps, in attempts at delivery, was not denied, but that this should be charged to the safe and sane operation of pubiotomy was not quite fair.

In only one of his cases did a vesicovaginal fistula develop after the operation and this was due to prolonged pressure on the soft parts by an impacted mentoposterior face presentation. In this case, even the child was saved, as well as the mother. By no other known method of delivery could such a good result have been accomplished.

Dr. Marx said he preferred version in some cases of moderate contraction of the pelvis. It was precisely in this class of cases that the head could not be delivered in time to save the child. The fetal mortality here was absolutely prohibitive. He preferred craniotomy after forcible attempts at delivery had been made. Personally, he felt that craniotomy on the living child was unjustifiable. Dr. Marx advocated the Walcher position to increase the conjugate diameter. He believed with Bumm that this method had very little practical value. Only 0.5 cm. increase in the conjugate diameter could be possibly gained this way and usually only a few millimeters were gained.

The morbidity after pubiotomy had been highly exaggerated by the opponents of the operation. The average lying-in period for these cases was about three weeks. The first case he ever operated upon was up on the sixteenth day after operation and left the hospital on the eighteenth day after delivery with her baby. A couple of months later he exhibited her at the Academy of Medicine and then she walked perfectly and had no complaint whatever.

Dr. Holden favored Cesarean section and stated that the patient was back at her wash-tub in three weeks after the section. This was probably true; but it was also a fact that after Cesarean section the patient was not cured of her pelvic contraction and had the cheerful prospect of coming back to him, or someone

else, for another Cesarean section every time she became pregnant thereafter. This was not the case after pubiotomy because here the pelvis remained usually permanently enlarged, so that the following labors were easy. One of his had a precipitate labor a year after her pubiotomy.

He mentioned the liability of the saws to break. This was of frequent occurrence unless certain precautions in the technic were observed. First, the saw must not be bent at an acute angle. Second, the sawing must be done very deliberately and the whole length of the saw used and not only a few inches of the center. Third, the sawing must be done slowly. The saw was only a bit of wire and working in a bone which itself was about 100° Fahrenheit, the friction of sawing quickly raised the temperature of the saw so high as to break it.

He was glad to hear so able an obstetrician as Dr. Polak say that he was against sacrificing the child and that he was doing fewer craniotomies.

He could not agree, however, that the passage of the child after pubiotomy tore the vagina. Two factors operated after the division of the bone in tearing the maternal soft parts. First, the position of the patient's legs being bent over her abdomen. This raised her abdominal pressure and forced the fetal head down against the pubic bone. As soon as the bone was divided, the fetal head forcibly and suddenly entered the pelvis and in so doing wedged the cut ends of the bone apart. This gave no time for accommodation to the soft parts and they tore asunder. Second, by allowing the toes and feet of the patient to become everted too much. In this way the head of the femur acting through the acetabulum acted as a lever to pry the cut ends of the bone apart and proportionately to the amount of eversion of the patient's feet would her soft parts be torn. To prevent deep and communicating lacerations he operated upon the patient while she was on her back with her legs extended.

Only after all was ready to proceed with the delivery, were her legs slowly and evenly raised and made fast in the lithotomy position; but the thighs were kept at a right angle with her trunk so as not to raise the intraabdominal pressure, until the child had been delivered.

The feet were not allowed to become everted any more than necessary to gain sufficient bone separation for easy delivery of the child.

The amount of enlargement of the pelvis was within certain limits quite under the control of the operator by allowing more or less eversion of the toes. From 1 to 3 inches was the usual amount required and obtained. More than 3 inches separation might, perhaps, endanger the integrity of the sacroiliac joints, but such an amount of separation would be rarely called for. Dr. Rongy has three successful pubiotomies to his credit, all done within the last three or four months. He agreed with him that in moderate degrees of pelvic contraction pubiotomy and Cesarean section did not compete. The operation of choice was

pubiotomy and the section was to be reserved for cases of absolute indication, usually followed by sterilization of the patient.

A couple of years ago it was rumored that one of his cases was operated subsequently at the Gouverneur Hospital for osteomyelitis of the pelvis. The house surgeon there assured him that such was not the case, but that a case which had undergone a pubiotomy, some time previously, developed an abscess above the knee. This was incised and packed and the patient sent home.

In answer to Dr. Browd's question I would say that the amount of pelvic enlargement was to a great extent under the control of the operator. Also that for every 3 cm. in the transverse diameter, 1 cm. was gained in the conjugate diameter. Furthermore, that it was most difficult for even the most expert obstetrician to correctly measure the capacity of the female pelvis and not at all possible to measure either the size of the child's head, or the expulsive power of the woman in labor; so they are reduced to the necessity of two following expedients in doubtful cases. See whether you could make the child's head enter the maternal pelvis by pressure from above. If so there was no great amount of disproportion and the patient would probably be able to deliver herself. Or wait and give her a sufficient test of labor. This was after all the supreme test of all. If one's judgment was wrong and she could not deliver herself, then in case of moderate disproportion, with a living child, and the head not engaged, pubiotomy was in place to expedite delivery.

Replying to Dr. Tousey he said that it was not proper to raise the periosteum from the bone before the section. So doing might induce necrosis of bone.

In answer to Dr. Morton's question about the weight of the children born spontaneously after two of his pubiotomies, he regretted to say that he was speaking from memory, not having the data with him. His impression was that they were average children, whose heads were perhaps a little larger and a little harder than the ones gotten at the time of the pubiotomies, because, according to a well-known law of heredity, each child, up to the fifth has a somewhat larger head than the previous one.

Furthermore, the pelvic bone did not as a rule unite solidly. It would not be well if it did. But the patients walked perfectly well after the parts were healed.

Replying to Dr. Wiener who stated that he saw in Berlin on a recent visit there a regular procession of pubiotomy cripples parading in the neighborhood of the clinic, he said that this statement interested him strangely. It sounded so well. He also attended the clinics not only of Berlin but those of a number of the largest cities in Europe, and saw several Americans do the operation and had done ten himself and had not yet seen one permanent cripple after, or due to pubiotomy. It had a distinct field as a life saving measure for the mother and child in cases of moderately contracted pelvis.

REVIEW.

OPERATIVE OBSTETRICS, INCLUDING SURGERY OF THE NEW-BORN. By EDWARD P. DAVIS, M. D., Professor of Obstetrics, Jefferson Medical College, Philadelphia. Octavo volume of 483 pages, with 264 illustrations. W. B. Saunders Company, Philadelphia and London, 1911. Cloth, \$5.50 net.

This latest work of a distinguished author in its introduction sketches briefly some salient points concerning the anatomy of the uterus and pelvis, the aseptis of the birth canal, the conditions affecting hemorrhage in normal labor, obstetric anesthesia, and the general technic of obstetric surgery. Then follow the four parts into which the subjects treated are divided.

Part 1, on *The Surgery of Pregnancy*, includes uterine displacements; the removal of uterine tumors during pregnancy; operations upon the fallopian tubes and ovaries; operations upon the pelvic floor and rectum; therapeutic abortion; the induction of labor, which is gone into with much care; accouchement forcé; appendicitis; cholecystotomy; operations upon the kidneys; and ectopic gestation.

Part 2, on *The Surgery of Labor*, enters the field where the greatest advances have been made in modern obstetric practice and where the influence of modern surgical principles is most strongly felt. The section begins with a careful exposition of the manual extraction of the child through the vagina and then takes up delivery by forceps. In speaking of the conditions making forceps delivery justifiable the author says:

"The head must have engaged in the pelvic brim and moulded itself into the pelvic brim before the use of forceps is justifiable. It has been abundantly shown that the use of forceps upon the head not engaged above the pelvis or but just beginning to enter the brim is followed by dangerous pressure, often by cranial or intracranial hemorrhage, and permanent injury to the nervous system. In many cases the child dies as the consequence. With other obstetric operations as successful as are now pubiotomy and Cesarean section, unless the child is to be deliberately sacrificed, the forceps should not be applied to the head until engagement and moulding have occurred. If it is proposed to sacrifice the child, craniotomy is safer for the mother than difficult forceps extraction, the head not being engaged. The operator should know that the pelvis is of sufficient size to permit the passage of the head. Engagement and moulding is a practical demonstration of this fact, so far as the upper pelvis is concerned; there may be, however, contraction at the pelvic outlet sufficiently great to destroy the life of the child during its exit. Pelvimetry, then, should be practised before forceps extraction and the measurement of the outlet included.

Pelvimetry should include palpation of the pelvic cavity, as well as measurement by the hand and by the pelvimeter. For successful forceps operation the cervix must be dilated or readily dilatable to its full extent by the hand, the membranes should be ruptured before the instrument is applied, the bladder of the patient should be completely emptied under anesthesia by the catheter, the rectum should have been emptied by injection, and aseptic and antiseptic precautions should be observed. A competent assistant and anesthetizer should be at hand, and the necessary appliances for checking hemorrhage, preventing infection and repairing lacerations. If these conditions and surroundings cannot be commanded, a physician will do well to abstain from the application of forceps and summon competent aid." . . . "It may seem incredible that an educated physician should attempt to drag the fetal head with the obstetric forceps through a pelvis too small for it. Yet those who see cases brought into hospitals and who have a consultation practice will admit with regret that such is the case. The simple rule of practice which asserts that after a reasonable time, the head not descending, it must be pulled down, and that if one physician cannot pull it down, two or more can, is sure at some time to bring its follower into an obstetric disaster. It may be too much to expect the general practitioner to know and practise pelvimetry or for the recent graduate to provide himself with a pelvimeter. But recent graduates are taught to recognize engagement of the fetal head, and the general practitioner should have learned the same lesson. It would be better for the patient if no attempt be made to deliver and the child die than to have forcible attempts at delivery with great disproportion. Those who urge that if the pelvis be accurately measured and found to be normal, the head, though even not engaged, may be grasped by the forceps and safely delivered, omit one important factor in the problem. We have as yet no reliable and accurate method for measuring the fetal head within the womb. Our only efficient and reliable test is the presence of engagement and moulding; if this be absent, efforts at delivery by traction are purely experimental. The least injury which can follow such efforts is damage to the child's nervous system, or its death from the exercise of pressure, while the mother may escape with more or less laceration." . . . "The results of the use of the forceps depend very largely upon the skill and technic of the operator. Thus, it is possible for a skilled and careful obstetrician to use the forceps for years without maternal mortality resulting from the use of the instrument. On the other hand, the improper use of forceps may be followed by a double mortality." . . . "In comparison with other operations the skillful use of the forceps in selected cases is without maternal mortality, has a maternal morbidity of about 10 per cent., and a fetal mortality of not less than 10 per cent. In improperly selected cases, disregarding the absence of engagement, and moulding, the use of the forceps

has a direct maternal mortality of from 3 to 5 per cent., a maternal morbidity of 20 to 30 per cent., and a fetal mortality of 30 to 50 per cent."

The indications for version are given as follows:

"A transvers or oblique position of the fetus, the head not engaged and inaccessible for the forceps, prolapse of the cord while the head is presenting above the pelvic brim, a second child in twin pregnancy, conditions in which prompt delivery is necessary but as the head has not descended and engaged the forceps cannot be used, malpositions of the fetus which render the engagement and descent of the head impossible, are the principal reasons for the performance of version. In placenta previa version is done to check hemorrhage at the sacrifice of the child's life. On the contrary, in prolapse of the cord, version is performed to save the life of the infant. The advantages of version are that it enables the physician at once to diagnosticate accurately intrauterine conditions which have caused labor to cease and it places the fetus practically under his control. With one accustomed to operate by version, the operation can be performed with very little assistance and possibly without a trained person. It is thus the expedient of the general practitioner, should he be overtaken while alone with some serious obstetrical emergency. The performance of version requires, in itself, no instruments, although extraction is often accompanied by laceration, and the operator should be prepared to control hemorrhage and immediately repair lacerations."

After noting that symphyseotomy or pubiotomy may be indicated in moderate disproportion between the head and pelvis with a dilated or dilatable birth canal he goes on to say:

"As symphyseotomy (or pubiotomy) is a child saving operation, it should not be performed where the fetus is dead or likely to die, and it should not be undertaken in infected women, for it opens a region rich in blood-vessels to the access of septic material. Its range is, therefore, limited, but in this narrow compass it has utility."

Vaginal hysterotomy, or vaginal Cesarean section, is indicated in "some conditions which require the prompt emptying of the uterus, where circumstances are favorable for vaginal delivery. . . . "This method is often selected in eclampsia, in threatened death of the mother from heart disease, in premature separation of the normally situated placenta, in threatened occlusion of the umbilical cord, and in the event of the sudden death of the mother, the fetus surviving. . . . "Vaginal Cesarean section is not indicated in contracted pelvis, for it does not enlarge the pelvis. Its performance is an error under these conditions. It is also contraindicated in septic cases because it leaves the septic uterus in a condition favorable for the development of severe infection. It is also not indicated in overgrowth of the fetus or in considerable disproportion between mother and child, and its performance in these cases will be followed by disappointing results."

In discussing delivery by abdominal section Dr. Davis says: "Next to the introduction of antiseptics in obstetrics, the most important advance has been in the development of delivery by abdominal section. This has substituted certainty for uncertainty, shortened suffering greatly, robbed contracted pelvis of its terrors, given much better control of hemorrhage, and saved the lives and health of many mothers and children.

"It cannot be too clearly understood that celiohysterotomy must be a primary operation. There must have been no previous attempt to deliver the mother, no frequent vaginal manipulations, no pre-existing septic condition of the birth-canal. Mother and child must be in good condition. The previous application of forceps, attempts at version, prolonged vaginal examinations, efforts to dilate the cervix, septic conditions in the vagina, the fetus exhausted by birth pressure, these are among the most important contraindications for celiohysterotomy. For the operation to be successful the surroundings must be favorable.

"The operator must be familiar with obstetric surgery and must understand thoroughly the principles of the operation. He must have . . . competent assistants . . . and experienced nurses. Spectators often think that celiohysterotomy is a very simple performance. This may be so when the operation is done by experienced persons with competent assistants, each of whom knows exactly his part in the operation. When these conditions are absent, celiohysterotomy is by no means simple or easy."

In technic the author recommends the long median incision of the abdominal wall with removal of the uterus from the abdomen and compression of the broad ligaments for the control of hemorrhage. Personally the reviewer prefers the small fundal incision with the uterus left in the abdomen. Of the author's ninety-five cases of delivery by abdominal section nine died. Of seventy-two uninfected cases in good condition one died. Twenty cases were infected at the time of labor, and among these eight died and twelve recovered. In those patients who recovered, the Porro operation was selected. Among the children in these cases, four died from inspiration pneumonia and birth-pressure, and six were dead at the time of operation.

Part 3, on *The Surgery of the Puerperal Period*, includes the manual removal of the placenta; the control of hemorrhage during labor; the control of hemorrhage after labor; placenta previa, in which, with the greater placental mass directly over the internal os and with mother and child in good condition, classic Cesarean section is advocated; premature detachment of normally implanted placenta; the immediate repair of lacerations of the genital tract; the correction of uterine displacements following labor; the surgery of puerperal septic infection; and puerperal mastitis.

Part 4 describes the *Surgery of the New-born*.

The book throughout is the mirror of the author's own methods and as such carries with it the authority of his extended experience.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Cause of Rupture of the Gravid Tube.—Miki Kiutsi (*Arch. f. Gyn.*, Bd. xcv, H. 2, 1911) gives the conclusions at which he arrived from the examination of serial sections of the specimen removed from a case of ruptured tubal pregnancy. He distinguishes between acute tubal rupture and the chronic form. Acute tubal rupture he thinks is due to compression of the villous tufts, accompanied by apoplexy, ischemia, destruction of the coverings of the ovum, hemorrhage into the sac, dilated veins, hematoma, and hemorrhagic infiltration of the edematous connective tissue. The primary cause of the pressure the author finds to be a plugging of the large intervillous veins which carry the blood to the villi. The supplying arteries bring this blood with considerable force and this force ruptures the plugged veins in which there is no outlet for the blood. Later the coverings of the ovum also rupture. Collateral circulation does not lessen the pressure. The rupture in sudden cases does not show a smooth opening as in slow cases, but an irregular rent. The strongest compression is seen in the periphery of the tufts. Intrascapular rupture occurs from bleeding into the connective tissue. First comes pressure, from sudden bleeding, killing the ovum. This results primarily from increased arterial pressure, secondarily from the rapidity of the blood stream. The death of the ovum comes from lack of nutrition due to obstruction of the chorionic circulation; it is a secondary result of the intervillous pressure. As the determining causal factor of the rupture of the chorionic villous vessels the author sees the weakness of the chorionic villi, which have a loose structure with large, dilated veins and large intervillous spaces, and this is due to the abnormal implantation of the ovum. Contributing factors may be contraction or torsion of the tube, and influences from without such as jumping, lifting, or coitus. Rupture of the tube results from increased venous pressure in the intervillous spaces, and this from pressure on the veins supplying the villi.

The Wassermann-Neisser-Bruck Reaction in Obstetrics.—Fritz Heimann and Robert Stern (*Zeit. f. Geb. u. Gyn.*, Vol. lxxix, No. 2, 1911) have made a serological examination of eighty cases of pregnancy in its various stages, especially toward the end of pregnancy, with the Wassermann reaction. In sixty-one of these the reaction was negative, and in nineteen positive. Out of these eight were undoubtedly syphilitic, having present exanthemata, condylomata, or other syphilitic lesions of the vulva. In four the history of syphilis was unmistakable; in two macerated fetuses had been born and premature labors had taken

place, or abortions occurred; in two who had no syphilitic manifestations themselves, the children showed them. In two cases with positive reaction the history was not so clear, still the author thinks that all these cases gave pretty good evidence of being syphilitic. Of the sixty-one cases giving negative reactions all were clinically free from syphilis and gave no history of any syphilitic symptoms. From these examinations the author thinks he may deduce the truth that the Wassermann reaction is as correct and valuable in pregnancy as in other conditions.

Pituitrin in Obstetrics.—Emil Vogt (*Münch. med. Woch.*, Dec. 19, 1911) at the Dresden Frauenklinik has made use of pituitrin in obstetrics, with excellent results. He has used it in abortion, premature labor, spontaneous and operative labor and postpartum hemorrhage both normal and pathological. He has used but one preparation of the drug which he thinks reliable. The injection is painless. The drug causes rhythmical contractions of the uterine muscle, and regulates and increases the amount of contraction. Its effect is seen in three to five minutes after the injection. The period in which the drug is injected is important, whether it is in the beginning of labor or in the stage of dilatation or expulsion. The most prompt effects are to be expected the nearer to the rupture of the membranes it is given. The greatest effect is seen in the period of expulsion, the contractions being rendered much stronger and more frequent, and the pauses between the pains shorter. The suffering is not increased. In the third stage of labor contractions are increased, but here it is less to be trusted. To prevent the weakening of the contractions which is seen in contracted pelvis this drug is most useful. In these cases it should be given when the head has entered the pelvis and is being molded. In multiparæ at the end of the dilatation and beginning of expulsion the best results are gained, the expulsion being rendered very rapid. Since this drug has been used in cases of contracted pelvis no forceps operations have been necessary although contracted pelvis is common in Dresden. *Tetanus uteri* was never produced. The heart beats of the child are slowed but no harm seems to result. The author believes that pituitrin acts promptly and energetically in the expulsive period; it makes normal labor more rapid, prevents secondary weakening of the contractions, and assists in the delivery in cases of contracted pelvis. It acts most strongly in the expulsive period, but acts also after the child has been born, by assisting the expulsion of the placenta. The author believes that in pituitrin we have the ideal means of increasing the contractions of labor.

Medical Education and the Midwife Problem in the United States.—A questionnaire containing some fifty questions concerning obstetric education and the midwife problem was sent by J. W. Williams (*Jour. A. M. A.*, 1912, lviii, 1) to the professors of obstetrics throughout the country. Forty-three replies were

received, representing one-half of the acceptable and one-fifth of the nonacceptable medical schools, which indicate a most deplorable condition of affairs, briefly as follows: Generally speaking the medical schools are inadequately equipped for teaching obstetrics properly, only one having an ideal clinic. Many of the professors are poorly prepared for their duties and have little conception of the obligations of a professorship. Some admit that they are not competent to perform the major obstetric operations, and consequently can be expected to do little more than train men-midwives. Many of them admit that their students are not prepared to practice obstetrics on graduation, nor do they learn to do so later. One-half of the answers state that ordinary practitioners lose proportionately as many women from puerperal infection as do midwives, and over three-quarters that more deaths occur each year from operations improperly performed by practitioners than from infection in the hands of midwives. Reform is urgently needed, and can be accomplished more speedily by radical improvement in medical education than by attempting the almost impossible task of improving midwives. The following reforms are most important: (1) Reduction in the number of medical schools, with adequate facilities for those surviving, and higher requirements for admission of students. (2) Insistence in university medical schools that the head of the department be a real professor, whose prime object is the care of hospital patients, the proper training of assistants and students and the advancement of knowledge, rather than to be a prosperous practitioner. (3) Recognition by medical faculties and hospitals that obstetrics is one of the fundamental branches of medicine, and that the obstetrician should not be merely a man-midwife, but a scientifically trained man with a broad grasp of the subject. (4) Education of the general practitioner to realize that he is competent only to conduct normal cases of labor, and that major obstetrics is major surgery, and should be undertaken only by specially trained men in control of abundant hospital facilities. (5) The requirement by state examining boards that every applicant for license to practice shall submit a statement certifying that he has seen delivered and has personally examined, under appropriate clinical conditions, at least ten women. (6) Education of the laity that poorly trained doctors are dangerous, that most of the ills of women result from poor obstetrics, and that poor women in fairly well-conducted free hospitals usually receive better care than well-to-do women in their own homes; that the remedy lies in their hands and that competent obstetricians will be forthcoming as soon as they are demanded. (7) Extension of obstetric charities—free hospitals and out-patient services for the poor, and proper semi-charity hospital accommodations for those in moderate circumstances. (8) Greater development of visiting obstetric nurses and of helpers trained to work under them. (9) Gradual abolition of midwives in large cities and their replace-

ment by obstetric charities. If midwives are to be educated, it should be done in a broad sense, and not in a makeshift way. Even then disappointment will probably follow.

Retroversion, Retroflexion, and the Gravid Uterus.—Jacobs (*Prog. méd.*, Nov. 1, 1911) says that in twenty years he has had to interfere thirty times to reduce a gravid uterus that was retroflexed or retroverted. In such cases the practitioner should use every measure to reduce the incarceration, before operating, and these endeavors may consume several days. The diagnosis is assisted by making pressure at the posterior wall of the vaginal junction with the uterus where the retrodisplaced fundus is felt. If such pressure causes a flow of urine, incarceration has taken place. By crowding backward and upward the uterus it indirectly lessens the pressure on the neck of the bladder. When the pregnancy is of but a few weeks standing reduction is comparatively easy, and the use of a Hodge pessary will keep the uterus in place. If the uterus is large, soft and fills the pelvis, the best result is obtained by placing two fingers in the vagina and trying to reach the promontory, at the same time crowding the fundus upward. The uterus is raised and at the same time made to roll forward by the pressure of the fingers. Success will be shown by a sudden yielding and slipping upward of the fundus. If these maneuvers are not successful, chloroform is given to produce relaxation and another attempt to reduce the uterus is made. The knee-elbow position may assist so that anesthesia will not be necessary. If the retention of urine persists, and edema of the vulva and lower pelvis comes on, with absolute constipation, the surgeon must interfere by laparotomy. In these cases it is the promontory that resists the rise of the uterus, which was situated low down at the time of conception and developed below it. Lesions of the adnexa, situated forward, such as ovarian cyst, may complicate the condition. The most serious condition that may be found is adhesion of the fundus due to past parametritis, pelvi-peritonitis, or annexitis. If these adhesions do not soften, the uterus remains bound down in the pelvis. These adhesions may be ruptured, and the necessary manipulations do not often produce abortions.

Conservative Cesarean Section after Rupture of the Membranes.—M. Le Lorier (*L'Obstét.*, Nov., 1911) found in the records of the service at L'Hôpital Beaujon nineteen cases of Cesarean section from forty-five minutes to six hours after rupture of the membranes. The results were excellent in thirteen cases; in six there were infectious complications, but all recovered. Of these cases three had had intrauterine manipulation before the operation, one manual exploration, and one the use of a rubber balloon. One had been in labor three days. The rapidity of the operations facilitated recovery, the average being thirty minutes in length. The author concludes that the Cesarean section can be done successfully after the rupture of the membranes, even after manual explorations in the uterus, and with infected amniotic

liquid. Of the author's nineteen cases all the children lived. The classical section is preferable to the extraperitoneal even in case of infection. Exteriorization of the uterus should be practised, and the fundus should be closed with a Lembert suture.

Examination of Fat in Human Milk by Centrifugation.—E. Plauchu and Robert Rendu (*Lyon méd.*, Nov. 9, 1911) find that centrifugation of human milk in an electric centrifuge for five minutes gives more correct results than chemical examination of fat in human milk. Their observations were made on forty-six young primiparæ, at various times of day and during 530 consecutive days, with a total of 3450 examinations. All the women were under careful observation in a maternity hospital while the tests were being made. The authors found that there are considerable daily variations in the amount of fat in human milk. The average amount per liter is 34 grams, varying being from 5.50 to 164 grams. Multiparity, age of the nurse, and duration of lactation have little influence on the amount of fat. Feeding, galactogogues, and menstruation have none at all. Factors that are of importance are quantity of secretion, hour of nursing, phase of nursing, and asymmetry of the breasts. The more milk a woman gives the less fat there will be; the morning milk is richer than the night milk; the first milk drawn is richer than the last; the smaller the breast the richer the milk. Milk that is either too rich or too poor will cause digestive disturbances in infants, especially the premature. Premature children should not be given the first milk, but the last of the nursing.

Extrauterine Gestation.—T. C. Savage (*Proc. Roy. Soc. Med.*, Obst. and Gyn. Sect., 1911, v, 72) records a case of extrauterine pregnancy diagnosed at the time of spurious labor, and operated upon by laparotomy. Both mother and child were saved.

GYNECOLOGY AND ABDOMINAL SURGERY.

Changes in the Vessels of the Uterine Mucosa at the Menstrual Period.—R. Keller (*Zeit. f. Geb. u. Gyn.*, Vol. lxix, No. 2, 1911) has made a careful examination of specimens of uterine mucosa from cases which were operated on in the premenstrual or menstrual phase, with reference to the changes in the blood-vessels that take place at menstruation. He finds that just before the menstrual period a characteristic change occurs in the smallest arteries of the uterine lining, which has to do with the coming on of the menstrual period. These alterations consist in a hyaline change in the middle coat of the smallest arteries, and the few elastic fibers found in these walls participate. The endothelial changes in these small arteries consist in a swelling of the cells and difficult staining of the nuclei; in the veins no changes take place. In the large arteries connected with the muscle of the uterus no lesions are seen. There can be no doubt that these hyaline changes have something to do with the rupture and opening of the small blood-vessels at the menstrual period, which

allows blood to pass out into the stroma. In the intervals between the periods, when there is little secretion from the mucosa these hyaline changes in the vessels are not found; therefore these alterations may be characterized as menstrual changes in the lining of the uterus.

Relation of Menstruation to the Onset and Frequency of Epileptic Seizures.—In view of the popular idea that menstruation increases the frequency and severity of epileptic attacks, W. Alexander (*Med. Press*, Dec. 6, 1911, 600) has for twenty-three years kept the daily records of attacks observed at the epileptic homes at Maghull. His statistics show that the establishment of the monthly period has usually *no* definite relation to the frequency or severity of attack, and in the majority of female epileptics the seizures *do not* occur immediately before or after the menstrual period, nor is there usually any augmentation in their number or severity at these times. The statistics prove that menstruation has very little, if any, influence on the number of attacks, and if it has any influence that influence is directed rather toward the reduction of attacks than to their increase.

Uterine Fibromata.—S. J. Young (*Jour. Indiana State Med. Assn.*, 1911, iv, 505) says that the present status of opinion is that these tumors should be operated upon only when they produce symptoms. He believes that treatment should be based on potential pathology rather than on individual symptoms. Statistics teach that degenerations and complications are very common and widespread. From 12 to 15 per cent. of cases not operated on will probably die as a result of the tumors. Inasmuch as mortality from operation in favorable cases is very low, probably 1 to 3 per cent., we should make it a rule to advise operation unless contraindication exists, such as grave anemia, pelvic infection or pregnancy unless the tumor is liable to complicate delivery.

Method of Approaching the Lower Abdomen.—According to G. W. Roberts (*Surg., Gyn., Obst.*, 1911, xiii, 684) the central abdominal incision is fundamentally wrong because it cuts across at right angles and permanently weakens the fascia (the tendon of insertion of the external and internal oblique and transversalis abdominis muscles) thus placing the suture line and the scar line under the greatest possible strain. While the central incision is capable of indefinite extension upward this helps one but little in dealing with pelvic and lower abdominal conditions, while every inch adds to the danger of ventral hernia. Four-fifths of the pain following laparotomy by central incision is due to pull upon the stitches uniting the tendon of the lateral abdominal muscles, and can be avoided by separating these fibers instead of cutting them transversely to their line of pull. The incision advocated by the writer is made with a sharp, hollow-ground knife with offset handle, and is a semicircular skin-graft incision 4 or 5 inches long and so placed that it is all or nearly all below the pubic hair line and the center of its convexity comes

just above the pubic symphysis. The knife is held at such a slight angle to the skin that it cuts a graft from $1/4$ to $1/3$ of an inch long before it reaches the subcutaneous tissue; at this point the skin graft knife is laid aside, the graft is wiped back and, the incision continued in the usual manner to a scalpel down to the fascia of the external oblique which is bared by gauze wiping. In traversing the fat layer the incision is carried somewhat upward till it reaches the external oblique about $1\frac{1}{2}$ inches above the pubic border; the anterior rectus sheath is cut from linea semilunaris to linea semilunaris exposing the perpendicular fibers of the rectus abdominis on each side as well as those of the two pyramidales, when these little muscles are present. From the ends of this incision (which is usually about $2\frac{1}{2}$ inches long) an incision is made which *splits* the fibers of the external oblique upward and outward for 2 or 3 inches and also a similar incision which *splits* the fibers of the internal oblique outward toward the pelvic wall in a direction which carries the incision under the lower portion of the external oblique—the transversalis being hardly distinguishable in this location. This flap lying anterior to the recti is lifted up and the fibers dipping down between the recti are cut until the recti are bared for 4 or more inches. The recti are separated and the peritoneum is opened. The wound is closed with No. 1 plain iodine catgut, the sutures being introduced as follows: (1) One continuous suture enters the border of the left rectus or pyramidalis at the lower limit of its separation and then passes back and forth through the peritoneal borders in such a manner that these edges are turned out and broad peritoneal surfaces are approximated: when this line of suture has reached the upper limit of the peritoneal incision the last stitch goes up through the border of the right rectus and begins a continuous suture of the rectus borders, consisting of not more than four stitches terminating at the lower end of the incision where the thread is tied to the other end of the peritoneal suture which has meantime been held by a forceps; (2) another long strand of No. 1 catgut having a forceps attached to its end approximates the fibers of the oblique abdominal muscles: on the patient's left side it pierces the lower edge of the external oblique and then of the internal oblique and transversalis, and then as an over and over stitch approximates the edges of the internal oblique and transversalis as far as the left linea semilunaris when it begins to involve all muscles in front of the recti as far as the right linea semilunaris. To the right of the right linea semilunaris the suture again approximates the separated fibers to the internal oblique and transversalis only, but the last stitch goes up to the upper border of the external oblique at the limit of the incision on the right where it begins to return to the point of starting—involving external oblique only as far as the right semilunaris. Then in front of the recti the stitches are placed between those of the earlier portion of the suture and on the left side closing the external oblique and being tied to the beginning of the strand.

(3) A single strand of the same sized catgut closes the skin wound as a subcutaneous stitch, leaving the original skin graft or flap unattached as it was when the skin graft knife was laid aside. The fat layer is allowed to take care of itself, our only precaution being to accomplish perfect hemostasis and to squeeze the air out of the deeper portions of the wound before the subcutaneous suture is tied. The skin flap is now fastened in place by means of strips of sterile court plaster $\frac{3}{4}$ of an inch wide and $1\frac{1}{2}$ inches long, which approximate the edges with uncovered intervening spaces of about $\frac{1}{4}$ inch. The incision is then exposed to the air for one hour or long enough to dry the wound. The patient begins to sit up as soon as she chooses and the plaster strips are removed on the fifth day. This incision gives ample room for all pelvic and most lower abdominal work, including Cesarean section but excepting the removal of solid tumors over 7 or 8 inches in diameter. For ordinary pelvic work it gives a better approach and requires less retraction than the central incision; it gives far less pain and is less liable to suppuration because there is less strain on the stitches, practically none, and therefore the finest catgut can be used. The scar is in most cases invisible, ventral hernia never results even if the wound suppurates; healing is quick, the patient is up early, and never requires a belt or support of any kind. The wound is covered only by transparent isinglass plaster strips. Drainage, when necessary, is by a stab wound in the center of the base of the flap.

Neuropathies and Psychopathies of Genital Origin.—L. M. Bossi (*Rev. mens. de gyn., d'obst., et de pæd.*, Nov., 1911) believes that much hysteria and many neuropathic conditions and psychopathies, with their resulting suicides and crimes, are dependent on chronic lesions of the genital organs, especially when of infectious origin, or caused by displacements. He cites many cases in which hysteria, Graves' disease, mental alienation, kleptomania, suicide and murder have resulted in individuals in whom it was possible to demonstrate the presence of chronic genital lesions. Many of these cases recovered from their troubles after a careful course of gynecological treatment. It is the duty of the physician to recognize these facts and to treat these conditions gynecologically, and in this way to prevent crime, undeserved stigma upon the children, and suffering of the patients. The nervous system is an apparatus that is conductive and receptive and it often reproduces in an erroneous manner. Suicides frequently occur at the menstrual periods. Some patients have been kleptomaniacs only at that time. A great number of patients diagnosed as hysterics, and epileptics are treated by bromides, electrotherapy, suggestion, and hypnotism when they should receive careful examination and gynecological treatment. Many violent crimes result from functional and anatomical alterations of the genital organs; crime is committed at the time of a temporary access of insanity, from an accidental cause, occurring at a neuropathic period. Insanity represents

only the acme of nervous perturbations due to utero-ovarian alterations. Dementia precox may result in this way. Every insane woman should be carefully examined and treated gynecologically. The author advocates an active propaganda among physicians and the public to teach the undoubted effect of conditions of the genital organs on the nervous and mental systems. When crime in women comes before the courts the patients should be examined to ascertain whether it was not the result of an abnormal genital condition. Insane patients should also be examined and treated in the same way.

Diffuse Tuberculosis of the Uterus.—Tuberculosis of the uterus generally involves chiefly the mucosa or peritoneum, but in a case recorded by C. H. Roberts (*Proc. Roy. Soc. Med., Obst. and Gyn. Sect.*, 1911, v, 57) the musculature was principally affected. Removed as a fibroid uterus, the organ showed general enlargement with areas of caseation and epithelioid and giant cells.

Abdominal Incision for Pelvic Surgery.—C. G. Child (*Jour. A. M. A.*, 1912, lviii, 91) recommends the following modification of the Pfannenstiel incision because of the freedom from shock and postoperative hernia; close proximity to the pelvic organs, with easy access to the field of operation; high percentage of primary wound-union; and cosmetic perfection. With the patient in the Trendelenburg position, a transverse incision 2 to 4 inches in length is made in the edge of the suprapubic hair, or in the transverse skin fold usually found just above it. The wound is now stretched with the fingers, the underlying fascia is incised in the same direction and to the same extent, 1 to 2 inches above the symphysis pubis. The extent of the fascial incision to either side should be limited by the outer borders of the recti muscles, and if a larger opening is required, the incision should be curved upward, or follow the outer borders of the rectal sheaths directly upward, to avoid injury to the external rings. Dissecting the fascial flaps free from the underlying muscles by blunt dissection with the finger (from the linea alba they must be cut with the scissors), discloses the two recti overlapped by the pyramidales. The right pyramidalis is separated at its outer edge from the underlying rectus but not from the linea alba, and retracted to the middle line. Under this the rectus is separated from the middle line and retracted outward. The peritoneum now lies exposed, and the abdominal cavity is opened by a vertical incision. The lower flap is retracted by a self-retaining retractor, preferably that of Doyen, and the upper one by a small movable abdominal retractor.

Treatment of Uterine Fibromata with Radium.—H. Cheron (*Jour. de méd. de Paris*, Dec. 9, 1911) finds that radium has somewhat the same action in uterine fibroids as the x-rays. Radium causes a lessening of hemorrhages, both between and at the menstrual periods, and some retrogression in size of the growths, due to a lessening of congestion in the uterus. The

treatment must last for some time. Menstruation will become much less although the menopause is not at once established. If the treatment is continued the menopause will be established and without any unfavorable symptoms. The effect on the ovaries is not the same as that of the x -rays, since the development of the Graafian follicles is not interfered with, and a number of the author's cases became pregnant later. Neither does it seem to affect the production of the internal secretion of the ovaries. The action of the rays should be limited to small pelvi-abdominal fibroids, and especially those that by their distance from the abdominal wall are inaccessible to the x -rays; contraindications to the use of radium are malignant degeneration of the tumor, anemia resulting from severe hemorrhages, severe compression of the abdominal organs, and especially torsion of the ureters, increase in size of the tumor in spite of the applications, and undesirability of provoking the menopause. The application is made by introducing into the cervix up to the isthmus a tube of radium, protected by layers of gauze, so that it will give out beta and gamma rays. The tube should be left in place for six to eight hours at a time, and sittings should be repeated every three days for twelve sittings, if a decided menopause effect is to be obtained. A radium dermatitis may be produced in the vagina and cervix, but it is not serious and may be avoided by proper care; it is evidenced by a copious discharge from the uterus. The general effects of the treatment on the system are excellent, pressure is relieved by lessened congestion, and the patient feels well.

Remote Results of Radium Therapy on Adnexitis and Periadnexitis.—Henri Cheron (*Rev. mens. de gyn. d'obst. et. de pæd.*, Dec., 1911) says that in many cases the medical and surgical treatments of suppurative lesions of the adnexa is unsatisfactory on account of their slowness and the confinement to bed that are necessary. In the use of radium for these conditions we have a method of treatment that is rapid, lasting from one to six weeks, and that is definitely curative. It renders the prognosis much better. The radium treatment is the best medical treatment for these lesions and is equally effective with surgical measures. It enables us to save one ovary functionally perfect when both are involved.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

SYMPTOMATOLOGY OF INFANTILE PARALYSIS.

BY

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THE symptoms of poliomyelitis are as varied as the extent of its pathological lesions. They may be grouped under three general heads.

1. The manifestations of an acute systemic infection.
2. The symptoms of an acute and diffused inflammation of the central nervous system.
3. Signs of acute and chronic localized lesions of cord and brain.

I. GENERAL SYMPTOMATOLOGY.

Incubation.—The period of incubation has not been definitely ascertained. It apparently varies with the virulence of the infection, and the susceptibility and resistance of the patient. In experimental inoculation of apes, invasion commonly occurred in the second week, although the onset appeared as early as three days and as late as six months. (Williams.) Two to ten days is now accepted as the probable period in human subjects. A susceptible child whose resistance had been broken by unusual fatigue, exposed to repeated infections from hyper-virulent sources, might present a very limited period of incubation, and die during systemic invasion. Such a case came under the writer's observation during the Street Fair in a western city. A child, coming from a healthy and uninvaded territory in the woods to the town where the epidemic was rife, was taken fairing all the first day and refused to go out the following morning. Onset and death followed in seventy-two hours.

In some cases the incubation period has apparently lengthened to three weeks.

Aura of Attack.—In many cases there have been noted a series of initial symptoms before the actual onset of the disease.

These prodromata, slight in themselves, are yet fairly constant, and so distinctive as to form valuable points in the diagnosis of the disease in this early stage. A change of disposition will be first noted, with irritability and peevishness. An unexplained malaise will occur as in the case of the child who refused to go fairing. The child or adult may endeavor to ignore a weakness or prostration so unaccustomed. A feeling of sickness or shakiness will be experienced, attended with a slight dizziness or even vertigo. This vertigo and incoordination induce an ataxia which, taken with the accidents it is responsible for, form the aura of the attack.

The aura of the attack in a child is manifested by a stumbling gait or unaccustomed falls. In the adult, owing to the better educated conduction paths between cord and brain, the stumbling is less frequent, but does often occur. The adult, however, will experience a slight mental confusion, a certain cervical tension, and unaccounted tremor and an undoubted ataxia. The large number of cases in both children and adults in which trauma is given as a cause of the paralysis are many of them cases in which the aura of the attack has been unmistakably manifest.

A history of trauma was given in forty-seven cases of 635 investigated by Dr. Lovett. Of these, thirty-two cases gave a history of accident followed almost immediately by paralysis, and the balance after an interval of some days. The tables given are of such interest in this connection that they are included. It will be seen that only two of the falls can be excluded as not due certainly to ataxia and incoordination. (Child dropped by nurse. Child hit by stone.)

TRAUMA PRECEDING POLIOMYELITIS

Tabulation of forty-seven cases, except from Lovett.

Slight accidents:

Slight fall.....	20
Fall from cradle.....	3
Fall from swing.....	1
Fall from carriage.....	3
Fall from chair.....	1
Fall from automobile.....	1
Walking, skating or playing (fall)	5
Dropped by nurse.....	1
Falling under other children.....	1

More Serious Accidents:

Falling from third story window.....	1
Falling from first story window.....	1
Stone fell on head.....	1
Gate fell on foot.....	1
Fracture of tibia.....	1

Later Cases:

Fall from carriage, chair and bed.....	3
Fall, paralysis three weeks later.....	1
Injury: Sprain of ankle.....	2

Dr. Gregor's Instances.—A child was at the wash basin and fell while crossing the room for towels; a boy of six was observed falling about the house, went out, when he again fell and was carried home; a woman got out of bed and fell down becoming dazed.

A fall down steps, down stairs, down a bank, or the grassy terrace surrounding a house, have all been mentioned to the writer as causes of the paralysis. The following case is typical of such histories, but the osteopathic deduction from the fall is as original as characteristic.

Dr. Pretts, Plattsville, Wis., August 1, 1908.—Mary M., five years; slight fall two days before onset. Vomiting; pain in back and limbs; temperature 104° F, fell fourth day to 100, where it remained for two weeks or more. Paralysis fourth day, both lower extremities involved, left more than right; deltoids and shoulder group most affected; stiffness of neck and spine. Patient acquired almost perfect control of the arms and could use legs fairly well when last seen. Parents became dissatisfied with slow (?) progress of case and called an osteopath who diagnosed condition as "fracture of the neck" due to fall two days before onset.

Here the ataxia preceding more serious trouble is well illustrated:

Dr. G. H. Fellman, Milwaukee, April 29, 1908.—B. N., four years, male; predisposing cause autointoxication. Complained of pain in posterior surfaces of thigh. Walked like an old man, and also held to the wall for support, for two days. Stupor. Painful point over posterior branch of lower lumbar nerves. Paralysis: Both legs and muscles of erector spinæ group. July 30, 1908: Can sit up erect, extend right foot, flex and extend leg, and flex thigh. Left leg: Extends and flexes thigh, but cannot flex or extend foot.

Onset.—The symptoms of onset are also the symptoms of the arrested or so-called aborted form of the disease. The onset is cumulative rather than abrupt; the history of an absolutely

abrupt onset of this disease is due to the fact that slight febrile conditions are often overlooked in children and ignored in adults. The seeming suddenness of onset is due to the simultaneous rise in temperature, pulse and respirations, together with meningism, basilar headache, tremor, convulsive movements, and vomiting, with obstipation, and retained or suppressed urine. The onset occurs very often in sleep, the patient waking with high fever, and all the other symptoms enumerated. It may begin with a chill; it occasionally begins insidiously, with the graduated approach characteristic of typhoid fever.

A marked increase in the pulse rate to 140-150 is perhaps the most constant feature of onset. This is accompanied by a sharp rise in temperature to 104-106° F. Respirations are rapid, increasing to 40 or 60 per minute with no apparent cause. An immediate paresis of digestion is evidenced by severe and repeated vomiting, and constipation. Incoordination, tremor and ataxia are increased, and prostration is marked. Occipital headache and pain of an agonizing character between the shoulders and in the lumbar region are usually present. Cervical tension or rigidity will be complained of, or the whole spine may be spastic. Sleep is broken by muscular twitchings, which vary from a light jerking of the extremities to convulsive movements violent enough to throw the patient from the bed. Urine is scanty, retention frequent, and suppression not infrequent.

The type of onset varies somewhat in epidemics; meningism is the most marked feature at times, while gastroenteritis was more prominent in the Germanic epidemics of 1908-9. Some cases begin with an angina simulating tonsillitis, and in every epidemic a small percentage of cases develop with an acute multiple neuritis.

Circulatory System.—Epistaxis occurred during the onset in a number of the Wisconsin cases. Nasal hemorrhage may have been due to an individual susceptibility; it is more probable, however, that an extreme congestion of the nasal mucosa is excited, which is conducive to hemorrhage. We know that the nasal and pharyngeal mucosa and tonsillar tissues provide an atrium for the infectious virus. We also know that the walls of blood-vessels of the cord are rendered pervious by the action of this virus, and we suspect that the virus in some instances travels by way of the nasal mucosa and cribriform spaces of the ethmoid directly to the cerebral mucosa. It would appear that a congestion of the nasal mucosa, destruction of the integrity of the

wall of the nasal vessels, and a concurrent epistaxis may accompany the onset. Epistaxis at the onset occurred frequently during the Cornwall (England) epidemic of 1911.

The heart is much accelerated, often to double the usual rate. In the cases among children which fell under the writer's personal observation, the pulse during the acute stage ranged from 160 up, being counted with difficulty beyond that point. Dakin, in his report of the Mason City cases, states that the pulse is usually high, 100 to 150 in adults and ranging up to 200 in children. In a majority of cases the child is not seen until this stage is passed and paralysis has supervened, when the pulse immediately declines to about 100. The fall to normal may be delayed until invasion is over and a recession of the paralysis is evident. The pulse is weak and compressible in character, and may show marked irregularity. This early and violent change in the heart action is probably due to irritation of the accelerator branchus of the vagus. It may be caused by the virus in the blood acting on the center for these accelerator fibers, as it occurs before there is any evidence of destructive lesions in that area. This acceleration, however, may be due to the direct irritant of the virus on the heart muscle; such was considered by Rekseh of Rhenish Westphalia, who reported the following case:

A girl aged eight, after a mild prodromal stage, developed a flaccid palsy of both legs. Her general condition was excellent, and all of the organs, especially the heart, appeared healthy, when without any warning, death occurred suddenly on the second day, being probably due to the action of toxins on the heart muscle.

The increase in the pulse rate may be independent of temperature. The pulse rate is often unmentioned in otherwise complete reports, or it is manifest that the pulse recorded was taken in the later paralytic stage. The complete report given by Frizzell of the Princeton student's case is indicative of the typical cardiac change. It is stated this patient was seen fifty-six hours after the first intimation of illness, with a pulse of 90. The evening of that day it reached 120. The day being October 31; Nov. 1, the pulse declined to 90; Nov. 2, to 80 beats, and Nov. 3, when paralysis appeared, the pulse declined to 60-64, near the normal rate for a young adult male with a sound cardia.

A decrease in the pulse rate occurs in the postfebrile drop, and in cases of the sudden fulminating type. Persistent head-

aches, and a subnormal pulse and temperature followed an attack of the arrested type in an adult for a period of eight weeks. A pulse rate of forty-two was reported by Dr. Gregor and Dr. Hopper, during the Cornwall epidemic:

A. J., male aged twenty-five. A perfectly healthy man up to the time of his fatal illness; no history of tubercle; Sept. 22, severe frontal headache; retching; rose at 11 A. M., went for a short voyage on the bay; on the way home became sick, and vomited (not sea sickness). Arrived at dock at 5 P. M. Too ill to walk home, but walked up steps to a cab. 5.30 P. M., pulse 42; curled up in very lethargic state; feet cold; did not speak, but put out tongue when told; vomited a brown grumous fluid; became comatose; died at 8 o'clock P. M. Postmortem: All organs healthy except brain; meninges much congested. Lateral ventricles distended with fluid. Encephaloid type.

Vasomotor control is disorganized. Sweating is frequent and in some epidemics of such a profuse character and so constant that it is spoken of as a cardinal symptom of the disease. The conjunctiva may be congested. The face assumes a mask of brilliant red and white. Later, the paralyzed extremities become ecchymosed, bluish in appearance and cold to the touch.

Temperature.—A chilly sensation sometimes accompanies the onset in the adult and more rarely a distinct chill occurs. It is probable that this occurs not infrequently among young children, being overlooked or taking the form of a slight convulsion which is the way a rigor is usually manifest in infancy.

At the onset of the attack the temperature jumps to or near the maximum point attained. The temperature is high, rising to 104–106° F. for a short period of time, when it declines by crisis to about 100°, except in the most serious cases. It may rise higher, but 105 is the average elevation. The temperature is variable and may be misleading if this initial rise has not been noted. The temperature is not a reliable indicator of the severity of the attack, but a high temperature with correspondingly severe onset usually indicates extensive impending paralysis. The temperature declines by crisis before the paralysis is manifest in the majority of cases. It remains at or near 100° while the paralysis is extending, and then drops to subnormal in uncomplicated cases. The surface temperature of the affected parts is depressed.

The burning fever of onset is sometimes found unendurable by the victim. R. V., a ten-year-old boy reported by Marquardt of La Crosse, sought a garden sprinkler and laid under it, developing

a paralysis of all four extremities. His temperature when seen was 102°. Its height at onset can only be estimated.

The temperature of the cases of the arrested or so-called abortive forms is not always secured. The mother will say that the child had a high fever for one night only. Such a case is given where the temperature was secured:

Dr. Fred. Albert, Mason City, Ia.—H. A., male, aged seven, residing on a farm five miles away. Onset sudden, July 1, 1910. July 2, temperature 102.5° F.; severe occipital headache; pain and tenderness of spine. July 3, temperature normal; pain and tenderness had disappeared. Two other children in same house were ill June 29 and July 1 with similar symptoms. One recovered in a few days; the other developed typical poliomyelitic paralysis of the arm.

The arrested type may show as high a temperature as serious or fatal cases. The fever in complicated cases may be continuous or rise to the same point as that of sunstroke. Dr. Fellman of Milwaukee, reported a case of the cerebral type, which developed a temperature of 108.5 to 110°, per rectum, in the fourth week. The case was fatal. There is undoubtedly grave irritation of the heat centers in a majority of cases.

Respiratory System.—Coryza is so rare an accompaniment of this disease, that its presence at the onset is probably coincidental only. A pharyngeal angina occurs with more frequency; the tonsillar tissue has been found infected with the virus, which would account for pharyngeal and tonsillar congestion.

Respiration is profoundly affected in cases with a severe onset or extensive lesions. Respirations are at first rapid, rising to 40 or 60 per minute with no apparent cause. This rise may be attributed to the irritation of the phrenic nerve at its common origin with the spinal branches of the spinal accessory. A marked increase of the number of respirations per minute, due to irritation of the phrenic supply of the diaphragm occurs with cervical tension and hyperextension of head due to spasticity of muscles supplied by cervical plexus. (Spinal accessory and second, third and fourth cervical.) The lungs are found clear. Rapid respiration does not occur in cases of a very mild type, nor is it seen in cases of the arrested type with a mild onset. It reaches normal with the lowering of the fever and the appearance of paralysis. Two cases are given, one of the arrested type, one of the paralytic, both with very rapid respirations at onset.

Dakin's Series.—No. 10. J. L., six years; direct exposure;

sudden onset; chill; vomiting; pulse 150; temperature 102.4°. Respiration 60; no paralysis; recovered.

No. 24. K, one year; indirect exposure; sudden onset; vomiting; pulse 180; temperature 104°; respirations 80; muscular twitching; prostration; sweating; spasticity; paralysis of anterior tibial; contractures; improving.

Should the case prove to be one of the acute ascending type of paralysis, the respirations will remain elevated, or after a brief drop will again accelerate, becoming feeble in quality and somewhat irregular. This second or delayed involvement is due to a beginning paralysis of the muscles of respiration, the chest walls remaining fixed and the breathing assuming the abdominal type. The diaphragm may be paralyzed. Dyspnea is marked, and the acceleration of the heart shows involvement of the vagus. The Cheyne-Stokes syndrome may occur in both types of paralytic involvement of respiration.

The muscles of one side of the chest may be paralyzed, and the chest immobile, while the respirations are regular but feeble, and the respiratory excursion of the other half of the chest still evident. This type of breathing is paralytic and not irritative as at the onset. It is a bad symptom but cases have been known to recover.

A very rapid paralysis of respiration is due to bulbar involvement. Such a case may present a mild paresis only, a normal temperature, and be fully conscious, when sudden paralysis of respiration and death occurs. Cheyne-Stokes syndrome indicates involvement of the vagus.

Digestive Tract.—As has been well said there is an immediate paresis of digestion with the onset of poliomyelitis. It is evidenced by anorexia, vomiting, foul breath, sordes, and a disordered elimination which may take the form of diarrhea, but in the vast majority of cases it is manifested by a stubborn constipation with colic, tympany and meteorism.

Lack of appetite accompanies the prodromal stage, nausea and retching may or may not precede the vomiting. Vomiting is sudden and repeated. It may be constant for two days or more days, and is sometimes of the violent and projectile type. The vomiting is often attributed to faulty digestion, or an indiscrete dietary (green apples, sausage, sauer kraut). The outraged stomach disgorges food it is unable to assimilate, but repeated vomiting after evacuation are due to irritation, probably at the center. Projectile vomiting may be so violent that the vomitus stains the wall or ceiling of the patient's room. Wickman

reports a case of a woman vomiting with such force as to dislocate her jaw.

The vomiting of a brown grumous material is reported as occurring late in many fatal cases. The coffee-ground appearance of partly digested blood is suggested by these reports, and may result from an epistaxis with swallowing of the blood by the unconscious patient; exact knowledge on this point is to be acquired. Vomiting of the ordinary type was present in 62 of the 150 tabulated Wisconsin cases, of which one case is given:

Dr. G. W. Menika, Readstown, Wis., Sept. 20, 1908.—L. S., male, aged five years; pain; vomiting; marked constipation; prostration; nervous and irritable; temperature 104°; rash; convulsive; both heels drawn back upon buttocks; sensory nerves very acute in beginning of case, slight handling produced severe pain; paralysis of both legs. Oct. 6, unable to sit alone; legs lie extended, recovering motion in thigh muscles.

It is to be noted in this case that vomiting and constipation were present at the onset, but in the report the emphasis is put on the constipation. The checking of the elimination in these cases, which is most frankly manifested by a stubborn paresis of the bowels, should not be ignored. It is a constant symptom; it is a dangerous condition; in its detection and relief lies our only present hope of lessening or preventing the oncoming paralysis. It is interesting and suggestive to note that in experimental inoculation of monkeys, the virus introduced into the digestive tract proved inactive unless peristalsis was artificially inhibited.

Constipation is present in a vast majority of cases. Diarrhea is the preexisting condition to this fecal stagnation in some cases, and denotes an effort of the digestive tube to cast off the virus. In this country diarrhea is most often noted in the arrested or abortive type of case; the concurrent diarrhea noted in other members of the family during the progress of a case is a very certain indication that they have taken the infection. Diarrhea was reported as a more constant symptom in the Westphalia epidemic of 1908 (Krause). The bowel movements are large. The fecal stagnation is due to a temporary paresis of the tract; it is very resistant to catharsis and colonic flushings. In the carefully watched case of the Princeton student the bowels "were moved only with great difficulty for a month" from the time of onset, and this case was so mild that it just escapes classification as an arrested type.

The bowel movements are foul until free defecation is established; thereafter the stool appears to be normal.

The tongue is red at first, the papillæ of the anterior half noticeably dilated and scarlet; it subsequently becomes coated, and sordes gather on the teeth and gums.

Genitourinary System.—The urine is scanty and high colored. Albumin is not constant, but is found in a certain percentage of cases. An acute exudative nephritis has been reported. Frequent micturition occurs early, the symptom of a mild cystitis due to elimination of the virus by the kidneys. Retention or suppression may follow. Retention of the urine is a common occurrence. It is stated to have occurred 11 times in 150 Wisconsin cases, but it is often overlooked. Retention is due to a temporary paresis of the walls of the bladder together with scanty secretion. When the paralysis extends to the urinary sphincter there is incontinence; this is somewhat rare, and always temporary in uncomplicated cases. Delayed urination and dysuria may occur. Anuria and suppression have been noted in rapidly fatal cases of the spinal type. Retention and overflow may occur. Scanty secretion and retention are features of the first of the following cases; retention and incontinence of the second.

Dr. Frizzell, N. Y.—Princeton student, twenty-one years; onset Oct. 29, 1910; Oct. 31, pulse 90 to 120; temperature 101°; respiration 22; last urination Nov. 2, 6.30 P. M.; Nov. 3, unable to urinate; lumbar paralysis same day. Catheterized, scanty flow of urine; pressure over symphysis used; bladder paralysis lasted for twelve days; bowels were moved only with great difficulty for a month.

Lovett and Jones. Case xvi.—D. G., age two and a half years; acute onset Aug. 8; vomiting, retraction of head, retention of urine and distended bladder, with diagnosis of intussusception of bowel. Removed to hospital and operated; nothing found but an excessively distended bladder. Aug. 18, paralysis of both legs and right arm cleared diagnosis. (*Bulletin Mass. State Board of Health*, June, 1910.)

With an irritant and destructive process in the lumbar and sacral cord, and frequent involvement of the bladder, it is doubtful that the genital organs wholly escape functional and organic alteration. There seems to be little observation recorded on this point. The following case is the only one included in the Wisconsin report.

Dr. L. A. Larsen, Colfax, Wis.—W. B., male, six years; onset Sept. 26, 1908; chill, temperature 103°; rapid pulse; headache;

delirium; apathy; stupor; rigidity of neck; dyspnea; pain and tenderness over the whole body; photophobia; constipation; semi-erected penis all the time; Kernig's sign present. Paralysis: upper part of back, and right and left arm and forearm but not hands.

Dr. T. A. Williams, Washington, D. C.—A male adult presenting an incomplete transverse myelitis with acute onset had great pain in the testicles, followed by slight paralysis of the quadratus femoris. With a diagnosis of probable poliomyelitis the spinal fluid from this case was injected into a monkey, who became paralyzed six months subsequently. (Williams: Discussion, Section of Medicine, Penna. Medical Society, *Penna. Medical Journal*, December, 1911.)

Dr. Moss-Blundell, Huntingdonshire.—C. T., male, one year six months; onset August 21, 1911; drowsy, febrile; clonic spasm; opisthotonus. Paralysis; Aug. 23, all four limbs and back; retention of urine and overflow; death Aug. 28.

Cutaneous System.—Sweating may be profuse and has been reported as a characteristic symptom in some outbreaks. It is not usual.

Cutaneous hyperesthesia is common; it may take the form of a subjective sensation, the child complaining that there are flies walking across the skin, etc. One little girl said the mosquitos were killing her. The cutaneous temperature sense may be exalted or depressed; a hot water bag may be agreeable to the paralyzed leg, and unsupportable to its fellow. Tactile sensation may be delayed or exalted.

Vasomotor changes of the cutaneous surface occur in the parietic member which is congested in appearance with a lowered temperature.

A skin rash is found in something more than 10 per cent. of the cases and is often overlooked. The rash is multiform in character; it may be erythematous or urticarial in appearance, morbilliform, petechial, papular, pustular, or purpuric.

The measles-like rash is most common; it frequently leads to a diagnosis of measles. It consists of patches, not so large as the typical measles blotch, but otherwise resembling it closely. It does not, however, appear on the face and at the hair line, as in the classical measles rash, but is found first on the torso spreading from there to the extremities, and to the dorsum of the feet.

All of these varieties of rash were seen in the Wisconsin epidemic. A well developed scarlatinal erythema occurred in a child of six years with paraplegia and constipation. A fine

pustular rash was seen in two fatal cases in brothers, covering the torso of one, and barely noticeable in the other; the rash was fine but distinctly pustular. Purpura appeared on the hips and thighs of a rapidly fatal case.

An urticarial rash was present in six cases of poliomyelitis which were seen through all the stages of the disease in the Cornwall, England, epidemic of 1911. It was recorded as appearing three times on the abdomen and once on the abdomen and buttocks. (Gregor and Hopper.)

The multiform character of these rashes is evidence, as Frost has reasonably stated, that "no skin eruption can be said to be at all characteristic of acute poliomyelitis;" yet the virus acting with malignant energy, on every part of the system, induces a frequent cutaneous reaction, which may simulate any of the eruptive diseases. It should be borne in mind that such rashes may occur in poliomyelitis, to avoid confusing this disease with the relatively harmless acute eruptive fevers.

Labial herpes was reported once in Wisconsin. Wickman considers the condition not characteristic. It may be coincidental. Brown, of Toronto, reported a skin eruption in six consecutive cases of poliomyelitis, which followed the same course in each case. In each of the six cases a vesicular eruption was present when the case was first seen. The rash was typical, being present more or less all over the body. It was papular and vesicular, and was present also on the lower extremities, on both anterior and posterior surfaces. Sections through the vesicles show the latter not to be deep seated, as one would imagine on palpating them, but on the contrary to be only superficial, *i.e.*, between the malpighian and corneous layers of the skin. Apart from the perivascular infiltration no other pathological change could be found. Smears and cultures from the serum of the vesicles gave no uniform result.

Mental State.—A feeling of grave apprehension accompanies the onset of poliomyelitis which has been expressed as a feeling of impending danger. A farmer said he felt as if a cyclone was coming, and knew he must get the crops in, working into the second day of onset before he gave up. Prostration is early and more extreme than the symptoms would at first indicate. The profound effect of the virus acting on the ganglionic axis may provoke this unconditional surrender, but it may be regarded as a protective defence of nature. Evidence favors the theory that the patient who surrenders immediately lessens the danger

of paralysis with the recuperative power of rest. Ball, of Minnesota, notes in the series of cases he investigated, that in the fatal cases the patients took a varying degree of exercise after the onset of the disease.

A staring and frightened expression is often seen. Dakin of Iowa considered this facies characteristic enough to be called pathognomonic. "The face appears drawn, the eyes sunken with contracted pupils, staring in an unmistakable unwinking terror. The expression of fear has been noted by the families of patients in almost every case." The facial expression is noticeably anxious, questioning, and gives a prematurely aged cast to the countenance.

Excessive emotionalism, hysterical laughing and crying and change in disposition of children has been noted among the early symptoms. The adult may be extremely restless, and conscious of a vague anxiety and mental confusion. In this state and driven by apprehension he may continue to automatically perform his work for some time after the onset. Mental confusion and determination to remain at work is shown in the following case with its speedy lethal close:

Dr. Colin Russell, Royal Victorian Hospital, Montreal.—E., aged twenty-four; single; engineer; admitted at 12 noon; weakness; pain in right hip; inability to use hands; seven days previous he developed a sore throat but worked until the second day before admission; went to bed; during these seven days there was headache, pain in the neck; he had vomited, was constipated, and reported difficulty in thinking. On admission: pulse 76, temperature, 99; could not hold a cup in his hands; hands semiflexed, breathing abdominal and jerky.

Seven P. M. same day, respirations 65; temperature 99, pulse 56. In spite of extreme dyspnea, accessory muscles of respiration were not in action. 12 midnight; cerebation apparently clear. 3 A. M. death, sudden, of respiratory failure.

Pain.—Pain is a constant and early symptom of poliomyelitis. Its usual occurrence is in the form of basilar or occipital headache; this may be associated with an agonizing pain between the shoulders and in the lumbar region of the spine. In rare cases the headache is at first frontal, it then localizes in the occiput or at the cervical nuchæ. There may be a racking pain of the entire spine, which the patient will speak of as a backache. "I have had backaches before, but never anything like this!" said a farmer of fifty years, during the onset of the disease which proved to be fatal. Occipital, cervical and spinal pain are most

characteristic of this disease, indicating their origin in the acute inflammation of the meninges and spinal ganglia.

Myalgia of a mild or severe grade attacks the segments that will shortly become paralyzed; the myalgia of an extremity which precedes and accompanies the paralysis of that area, is not to be confused with the neuritis of great nerve trunks of the so-called neuritic types of the disease. The most careful handling of these cases will cause agony, but it seems possible to differentiate slightly, *i.e.*, that pressure more than movement causes the pain. The pressure pain is shown by the child submitting to be lifted to a chamber, but screaming with pain when resting on it. Myalgic pain may be constant or paroxysmal; it invariably precedes the paralysis of the segment, or group of muscles, and may cease with the oncoming of the paralysis; it more frequently remains for a varying period after the onset of paralysis, and may continue for weeks or months. Wickman considers that the extreme pain on movement is due to tenderness and rigidity of the spinal column.

Peripheral neuritis may characterize another class of case, with hyperesthesia and an intractable pain along the nerve trunks and into the posterior root ganglia. These cases do not usually develop a paralysis, but the pain and tenderness of the nerve trunk may be long continued. An adult patient in whom the disease was of fifteen years standing had never been free from pain for a greater period than a day. Pain is a minor feature of one class of case. The rapidly fatal cases of the bulbar type are very quiet, and do not seem to suffer.

Meningism.—Symptoms of meningeal irritation are rarely absent and in the meningeal type of the disease are marked. Cervical pain and rigidity, with some retraction of the head are commonly seen. The spastic condition may vary from a slight stiffness of the neck which prevents flexing the head on the chest, to retraction of the head, or an opisthotonus of so severe a degree that the child lies like a bent bow. The spasticity of the muscles may give a rigid spine with no flexing of same, "stiff as a board," "stiff as a log from head to heels," are not exaggerations of the condition in some of these cases. According to Frost this stiffness of the spine may be due to the pain and only in rare cases is due to actual contracture of the spinal muscles.

Reflexes.—The patellar reflex, when ascertained, may be misleading. It is usually exaggerated during the early stage,

which is short, and often unobserved. It is diminished or disappears prior to the onset of the paralysis in the usual case. As the paralysis of one leg usually precedes the paralysis of its fellow by 24 to 48 hours, the reflex may be exaggerated in the one extremity, and abolished in the other. There may be a persistently exaggerated patellar reflex in paralysis which affects only of the upper segment. Spastic cases are unable to completely extend the leg when the thigh is flexed at a right angle; this is known as the modified Kernig test, and is not usually present until the second day. Dakin notes a characteristic sign of stiff neck. The patient, if asked to touch his chin and chest will endeavor to do so by opening the mouth and depressing the lower jaw, the neck remaining rigid. In cases of cervical rigidity with involvement of the sternomastoids, the patient if told to look at an object will roll the eyes but make no attempt to move his head.

The superficial and deep reflexes vary widely in reaction in the different types and stages of this disease, and have not been satisfactorily classified in regard to it. The ocular reflexes are not characteristic, being subject to disturbances.

Meningitis.—As the irritant stage continues the symptoms of meningeal involvement become more grave. Twitching and jerking of muscles and tremor appear. Convulsive movements may be manifest as a twisting of torso, or true convulsive seizures occur. The dismissal of this subject with a brief note that convulsions sometimes occur in childhood is as misleading as the name infantile paralysis. Convulsions of the most serious and rapidly fatal type may occur at any age and to members of both sexes. The virulence of the infection and the area of the nervous system invaded are the factors that determine the convulsive seizure, and not age nor sex. The only evidence of the disease in child or adult may be a convulsive attack of short duration. The attack may occur under the most misleading circumstances, and may simulate, and be diagnosed as any of the diseases characterized specifically by convulsive attacks, notably eclampsia, tetanus or rabies. Such a case is reported by Wickman:

H. K., female, twenty-seven; sudden onset Aug. 19, 1906; fever, headache, pains in back; stiff neck; retracted head; violent tonic contraction of shoulder muscles, forearms, arms and hands; cramps so painful as to require chloroform; cramps continued second day and night, opisthotonus. August 21: the patient being six months pregnant, eclampsia was suspected and forced

delivery undertaken successfully. The cramps continued, extending to legs; dysphagia and aphonia occurred; death at 6 A. M. Aug. 22. Patient conscious throughout; autopsy revealed typical lesions of poliomyelitis.

Confusion, apathy, stupor and delirium are all seen, and may be said to be of a transitory nature in most cases. Coma is rare; such a case is given:

Dr. Bowles, Elewa, Wis.—Sept. 25, 1908, E. T., male, age eight years. Headache, pain in back and neck; temperature 102° F., comatose for several days; no paralysis; recovery; meningeal type, no spinal symptoms.

A case of convulsions of eleven hours' duration, is also given.

Dr. H. B. Cole, Black River Falls, Wis.—June 2. H. K., eight months of age, male, residing with a cousin who had attack of poliomyelitis in May of the same year. Pain, high fever; surfaces cool; stupor; convulsions came on rapidly; death in eleven hours after onset.

(To be Concluded.)

INTERPRETATION OF UNUSUAL TYPES OF POLIOMYELITIS:

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DURING the present world-epidemic of poliomyelitis, many of the cases present a clinical picture utterly unlike that of the older text-books; so much so that some physicians have declared their disbelief that they are poliomyelitis at all.

This attitude is due, however, to an erroneous interpretation of the meaning of symptoms and physical signs. It is specious to say that destroyed anterior horns is not the same disease as meningitis or rubro-spinal tremor. But the fallaciousness of this argument is brought home by the most commonplace illustrations; such as the unity of tuberculosis in spite of the disparity of symptoms between glandular enlargement, osseous-caries, pulmonary catarrh or meningeal inflammation. Suppurating bubo, acute pneumonia, and fatal septicemia is each a variant of the symptomatology provoked by the bacillus pestis; and only one of them need be present. Even the metabolic disorders show similar polymorphism. I need not weary you by the further illustration in which the whole realm of pathology abounds.

The truth is that symptoms and physical signs are merely the measures of the reactions of living matter to injury; and that the number and manner of these are comparatively few in type; and that perhaps none of them are pathognomonic of any specific noxa. Were this not the case diagnosis would be a matter of mathematical simplicity; whereas it is as a rule a matter only of inferential probability, too often not even susceptible of proof.

Many have supposed that the clinical laboratory puts an end to the need for judgment in estimating the factors for a diagnosis. But a little reflection shows that no certainty is derived from this means of exploration either. For we know that healthy individuals carry the diphtheria organism, the pneumococcus, etc., that the number of the tubercle bacilli in the sputum is no measure of a patient's incapacity; that a sick person's failure to react to the typhoid bacillus may be the cause of an absent Widal reaction, although an undoubted enteric fever is killing him; that the Wassermann reaction is not even generic *qua* organism, the patient reacting in this way in the presence of organisms, such as that of lepra, far removed from the spirochætæ!

These facts offend the logical sense only of those who do not appreciate how variable is the manner of reaction of living beings in accordance with the enormous complexity of their organization.

We are beginning to have some inkling of the nature of these complexities in our study of the amino-acids. But we have not yet ascertained the constitution of even the best known proteins beyond from 40 per cent. to 80 per cent. of the total amino-acids present; but we already do know the enormous differences which exist between the amino-acid constitution of such proteids as gliadin, zein, ovalbumin, casein, myosin, etc. For while gliadin contains over 37 per cent. of glutamic acid, ovalbumin contains only 9 per cent. and chicken myosin only 16 per cent.; while of leucin, maize contains nearly 20 per cent. and wheat gliadin less than 6 per cent.; and differences extend to the whole gamut.

While we are far from such exact analysis of the physical constitution which determines specificity, yet anaphylaxis to the serum of a different species is now a measurable phenomenon; and there is nothing to make us think that it differs from the phenomena which occur as a result of what we call idiosyncrasy to

certain albumins. The urticaria presented by some otherwise apparently normal people when they consume egg-albumin, strawberries, shell-fish, etc., respectively, corresponds in every way to the anaphylaxis studied in the laboratory. The reaction of some people to poison ivy is also anaphylactic.

Now, added to those governing relative and absolute immunity, these considerations form ground for the inference that it is in such individual peculiarities of reactivity of respective protein molecules that we shall find the explanation of the differing symptomatology produced by the same agent of disease in different persons.

The reaction to the noxa of poliomyelitis is no exception to this law. The recent epidemics have shown that the anterior horns may escape entirely in cases of severe infection in which the meningeal structures are actively inflamed. The disease producer is, however, unequivocally the same in the two cases; as is proved by the passage of the virus from monkey to monkey in the laboratory. In these animals, the same virus gives rise to the very variable manifestations shown in human beings during the present epidemic.

Cases.—The clinical picture which follows is so unlike the older conception of poliomyelitis that it is worthy of record, as it deceived three physicians at the head of their profession in their prospective generations.

The patient was a boy of six whom I saw at Warrenton, Va., September 3, 1910. His illness had begun on July 8th with a fever and malaise, from which he seemed to recover until attacked four days later by a paralysis of *spastic* type. Dr. Hicks then consulted with Dr. Hardin of Washington, with whom I saw the case, and who informed me that the child's left arm was held in rigid flexion and that the right leg was also spastic. So great was the rigidity that no deep reflexes could be elicited. But that the pyramidal tract was implicated was shown by the extension of the great toe on stroking the sole. Kernig's sign was present on the right side, there was pronounced rigidity of the back, but not of the neck. Dr. Hardin then diagnosed spinal meningitis. Dr. Spencer of Washington then saw the case and pronounced it a meningismus. When movement returned it was ataxic and difficult at first. A good deal of pain persisted for several weeks; but even when these phenomena ceased the child's right leg was left weak and he would sometimes fall down, so that I was asked to see him. I found absence of the deep reflexes in the right lower limb and a diminution of the left patellar reflex; the toe sign was normal, as was the sensibility.

Motility.—The walk was clumsy and the child inclined over

his right leg. On examination the right ham-strings were decidedly weak, the sural muscles less so, the quadriceps femoris slightly weak, and the left arm weaker than the right. The right thigh was three-quarters of an inch and the right calf one-half inch smaller than the left respectively. Poliomyelitis was of course responsible for the defect.

A still graver implication of the meninges occurred in a child of six whom I saw at Rockville, Maryland, with Drs. Linthicum and Mannar this summer. Slowly increasing and ascending spasticity of the lower limbs ushered in the disease, along with fever. I found the child lying stiffly in bed, but not in great pain. The deep reflexes were absent even from the arms, though these were not rigid. No reaction was obtained from abdomen or toes. Brudzinski's sign was absent, but there was a pronounced Kernig. Voluntary movements of the lower limbs could not be made, and those of the arms were weak. The pupils were widely dilated; but there were no other cranial nerve symptoms. The child was admitted to a hospital in Washington, and a lumbar puncture made to make sure of the absence of the diplococcus intracellularis, although I believed the case to be poliomyelitis. The rigidity increased, and the child died three days later before I could see it again. Permission was obtained to examine the brain postmortem; but no changes were found there. The examination of the cerebrospinal fluid was not made by a modern technic, and so added no light to the case.

Just as unlike the text-book picture as the preceding meningeal inflammation is the following case where the disease attacked mainly the medulla and pons, involving there not only some of the nuclei, but also the pyramidal and rubro-spinal fibers. The function of the former is generally known, but that of the latter has a clinical importance of comparatively recent discovery. Its fibers carry impulses from the red nucleus of the mid-brain, which in turn are derived from the cerebellum. Their function is to regulate the muscular tonus; and when they are interfered with, dysergia results.

Bulbar Poliomyelitis.—After one week of malaise and constipation, a girl of four years developed what was believed to be a sore throat, the neck being held stiff. Two days later, Dr. Copeland first saw her, and found rigidity of the neck, slight Kernig's sign, a scaphoid abdomen and exaggerated patellar reflexes. The child was apathetic.

These signs of meningeal irritation created a suspicion of an invasion by the diplococcus intracellularis, especially as during the next four days the apathy increased to the point of unconsciousness, swallowing became more and more difficult and the respiration slowed to a threatening of failure.

There also developed a large intention-tremor of the right arm and leg, and the power of articulation disappeared.

The dysphagia led to removal to a hospital, so that skilful feeding could be secured. Dr. Copeland did not ascertain whether or not it was spasm or paralysis of the pharyngeal or other muscles which prevented swallowing, but the history and other symptoms point to paralysis as the likelier cause.

During this time, the patellar reflexes disappeared and poliomyelitis was suspected.

The limbs were no longer rigid; nor was there distinct flaccidity. The plantar response had not been that of Babinski.

It was two weeks after onset when I saw the child. She then showed a slight concomitant strabismus and distinct facial asymmetry, the folds upon the right side being much more distinct; but there was no apparent diminution of facial movements. The neck was turned to the left, and appeared to be more able to turn in that direction against resistance than in the contrary direction.

I could detect no inequality of power in the movements of the hands and arms, neither being used very strongly; shyness or apathy may explain this. The extension of the right leg upon the thigh was distinctly weaker than that of the left side. I could detect no inequality in other movements; but none were vigorous for the strong child she seemed.

In walking, however, progress was dysergic, more especially in the right leg; the base was widened by spreading the legs, and she tended to utilize the support of the furniture when within reach.

The reflexes were all brisk, but the force with which the right leg extended on tapping the patellar ligament was much less than that of the left. The abdominal reflexes were present, as were the plantar; but the reflex of the right foot was less complete than that of its fellow; and a wide spreading of the outer toes when the sole was stroked (the fan sign) gave clear evidence of a slight impairment of the function of the pyramidal fibers somewhere in their course.

Babinski's combined flexion sign was seen at the right groin when the child rose up to sitting posture; and when she lifted the leg from the bed the contralateral pressure on the right heel was less than when the left one pressed on the bed.

The mother reported that the child had lost her cheerfulness and was both apathetic and querulous.

The child recovered almost completely, I am informed.

Transverse Myelitis at the First Lumbar Level Ushered in by Intense and Prolonged Testicular Pain.—A man aged thirty had a chill after long exposure to cold and wet. This chill was signalized by pain in the chest and abdomen, which finally lodged in the testicles, and became so intense that the patient, who was a Christian Scientist, could no longer stand it and called in a physician, Dr. Musgrave, who called in a genito-urinary man, Dr. Lehr, who called in the writer. They had found the chest negative, and there was no local tenderness or redness or swelling of the external genital organs.

I found a loss of the right lower abdominal reflex (tenderness, not marked, of the tibia upon the right side); diminution of patellar reflexes; exaggeration of Achilles reflexes and clonus which varied from day to day and from side to side. On stroking the sole the right great toe extended (which could not be confirmed as Babinski's sign, because the man held his toe in a peculiar position, which appeared to be normal); and the defense reaction was excessive. But as this was so bilaterally, and the left toe response was flexor, some significance might be imputed to the difference. Besides, there was a paradoxal response also, on the right side, though Oppenheim's procedure failed to cause extension of the toe.

The temperature had been 101, slowly falling for a week to normal. Pulse was over 100, patient was exceedingly irritable, the pupils were dilated; he could not sleep, looked frightened and very much perturbed. After two or three days, he developed first ankle clonus on both sides; the sign of Oppenheim became quite clear on the right side; there was never, however, distinct Babinski reflexes; second, the knee jerks became so feeble that they could only be evolved by reinforcement. His attempt to stand provoked intense tremor of the quadriceps muscle on the right thigh, which gave way; the contraction of the ham-strings was also weak; and the patient's station was feeble, the knees giving way. In the meantime, the lower abdominal reflex had returned, the pain in the testicles had become attenuated; but the patient had been taking morphine constantly. The tenderness increased along the tibia. The ankle clonus, which had been produced on both sides, concentrated upon the left side, and became quite marked.

All this occurred in a week, during the gradual cessation of the general symptoms. The pain subsided, occurring only at night. The pain in the shins disappeared, the ankle clonus weakened and finally disappeared, and the action of extensor pollicis of the right toe became less pronounced, though never quite disappearing. The patient was able to go to New York when convalescent except for the tremulous contraction of the quadriceps femoris, which has since cleared up. The diagnosis provisionally made was syndrome due probably to infective myelitis consequent upon this chill, probably poliomyelitis.

That the anterior horns or their efferent fibers were affected is shown by the enfeebled knee jerks and motor power of the quadriceps femoris. But the inflammation around these did not cause any material destruction of cells, for the patient has recovered the power of these muscles. The active disease too was confined to the upper lumbar segments; for the Achilles reflex was not diminished, and there was no weakness elsewhere. The main effect, however, was on the pyramidal tracts in the lumbar region as shown by the ankle clonus and modified toe

response. Though there was no loss of sensation, the afferent fibers, especially those from the testicular region, were intensely irritated while passing through the inflammatory area, about the upper lumbar level. There was no lymphocytosis; but a monkey inoculated with the fluid is now showing signs of paralysis, five months later.

Cases with Unusual or Delayed Onset.—It is sometimes puzzling when the paralysis is incomplete, or when no fever is noticed or when it precedes the motor weakness by weeks or months as in the following two cases:

A boy of five was noticed to be running with a hop on April 20, 1911. A week later he complained of walking with difficulty. He then improved. The preceding August he had had a slight fever for four or five days, thought to be malaria by Dr. Latimer of Hyattsville, who noticed no weakness at that time. He followed up the case, suspecting poliomyelitis; but the boy had continued active during the winter; but on noticing the limping Dr. Latimer brought the boy to me, as it was noticed he was over wearing his right sole.

On examination, I found no pain or hyperesthesia. The deep reflexes were sluggish. The motility was slightly defective in the right external and internal rotators, adductors of the thigh. The right quadriceps was slightly defective, and the hamstrings most of all. Rotation of the right foot was appreciably weaker than that of the left.

Faradic electricity showed diminution of the excitability of the adductors and extensors of the right thigh. There was inversion of the galvanic formula in the extensors of the right thigh, and apparent by the left also.

The boy had grown very rapidly in the spring; and had also put much more stress upon his leg as the weather improved. I believed that his illness in August, 1910, had been a poliomyelitis, the residual paralysis of which had been unnoticed until the added stresses of growth and greater activity had revealed it to his mother. I advised that he should not be allowed to walk or stand excessively, and that his mother should impose definite gymnastic movements for strengthening the weakened muscles, which should be massaged, and stimulated electrically also.

CASE II.—A boy of five and a half was brought to me by Dr. Gwynn, who one and a half years ago had had twenty-five convulsions in a few hours and secondary edema of the lungs. He had also had fever (possibly malaria), enlarged glands, and recurrent fever and chills, not malaria. He was much improved by open air treatment. All this began after sudden confinement in a small room. Ten months ago he had malaria with sudden chills all summer.

His health was good this winter until one month ago, when he felt a sudden weakness; but had no elevation of temperature.

This lasted half an hour; then he played all day, and was well until a week later, when he came in lame and swinging his leg. His legs had ached for a few days, and were worse at night. The lameness has increased. He draws up the leg, but straightening relieves it. He was suffering from a severe cold at the time of the attack.

Examination.—The leg could be handled without pain. Extension of right knee difficult. Right hamstring very weak. Right gluteus weak.

Electrical Examination.—No diminution of rectus or gastrocnemius.

Walk weak and uncertain in right leg.

Reflexes.—Right patellar nil. Right achilles minus. Mendel reflex present. Plantar present. No other inequalities.

Treatment.—The mother was advised not to allow the boy to stand or walk unnecessarily, but to encourage him to play and to apply galvanism daily to the weakened muscles as well as gentle, deep massage.

As a result, three and a half months later, the diminution of reflexes had disappeared; and although extension of the right knee was still weak, the vasti hardly contracting, the rectus did so well. The hamstrings and glutei were stronger, and the walk was greatly improved, the boy falling rarely. This good result was foretold on account of the normal electric reaction of the rectus and gastrocnemius at the first examination and the belief that the state dated from February 1911, and not from the preceding summer, as an orthopedist had declared. Had this been so, less improvement would have occurred.

The pains may be so prolonged and intense as to lead to a diagnosis of neuritis. But a persistence in this error in such a case as follows is indefensible:

Case mistaken for neuritis.

A boy of five while living in Massachusetts in July, 1910, had a sudden fever with colitis for ten days. Apparently cured by enemata he some weeks later suffered from what was diagnosed as toxemia, at which time he was unable to move his limbs and he became emaciated and had severe pains on passive movements. He remained thus for two months with atrophy of the legs especially the left. His medical attendant declared that there was no paralysis, only neuritis.

Examination of the blood furnished no positive indications. In September he was able to walk, but very imperfectly. Several consultants who saw him confirmed the diagnosis of neuritis.

On coming to Washington, he was referred to me by Dr. John Dunlop in January, 1911, for an opinion as to whether it was really a neuritis and what treatment should be adopted, as a suspicion of poliomyelitis had arisen.

Examination revealed the following: In walking and running the right foot was adducted excessively in a flaccid manner and the whole gait was somewhat flat-footed and clumsy. There was a tendency to jerking of the arms when he was hurried.

The sensibility was normal.

The Reflexes.—The patellar were diminished especially on the right. The Achilles were absent. The toes flexed normally on stroking the sole.

Chief attention was paid, however, to the electrical examination for which I was asked particularly, and a summary of the most marked abnormalities is appended.

Electrical Reactions.—Expressed by the number of cells of a Mackintosh portable battery required to produce a minimal contraction of the muscles when the electrodes were placed over the motor nerves and over the muscle respectively. A current of about ten milliamperes passes when about twenty-five battery units are used.

The first examination was made on January 19, 1911.

Reexamination April 13, 1911. The figures in brackets denote the result of the second examination.

Popliteus externus, R. 50, L. 40 (R. 30, L. 35).

Popliteus internus, R. 35, L. 35.

Sciatic, R. 35, L. 35.

Gluteus medius, R. 30, L. 30.

Gluteus maximus, R. 45, L. 50. (R. 50, L. 60).

(This increase is probably due to the greater resistance of the tissues on account of the improved nutrition of the patient having added to the subcutaneous layer. Besides on the second occasion the patient was less tractable and the results could not be so accurate.)

Peronei, R. 20, L. 30, L. 30 K. C. C. equal to A. C. C. (R. 20, L. 30).

Tibialis anticus, R. 30, L. 20 (R. 28, L. 25).

Gastrocnemius, R. 60 nil, L. 50 slight (R. 60, fair, L. 45 fairly good).

Rectus femorus, R. 30, L. 35.

Adductors, R. 20, L. 30.

Erector spinæ, R. 45, L. 35 G. (R. 45, L. 35 G. (R. 35, L. 35).

Recus abdominis, R. 60, L. 50 G. (R. 50, L. 45).

The ulnar, median and radial responses are practically normal, as are those of the individual muscles in the arms.

The shoulder girdle could not be examined satisfactorily; but the deltoid responded with 32 cells R. and 35 L., while the pectorales required 40 and 45.

Faradism gives no further important information, except that the right gastrocnemius failed to respond even with the full secondary coil on the right, while on the left it did so. (Second examination, the right side responded feebly even with the primary coil with the tube out, and the left side when the tube was out only two inches.)

The solei both responded with the secondary coil, the left better than the right, which requires the core to be pulled out two inches before responding.

The rectus abdominis responded to the primary coil with the

core out three inches for the right muscle and two inches for the left. (Second examination right muscle when the tube was pulled out 1 inch and left muscle when the core was in.)

The obliquus externus responded normally.

This report was furnished the relatives upon request along with a positive diagnosis of poliomyelitis. This was decided because of the marked lower motor neurone loss unaccompanied by loss of sensibility and more especially on account of the decided inequality of the motor losses revealed electrically. Thus, the perinei on the left side required a current 50 per cent. stronger than on the right to provoke contraction; and the cathodal contraction was no more easily provoked than was that of the anode; whereas, where the tibialis anticus was concerned it was the right leg which required a 50 per cent. increase of current to provoke contraction.

Again, while the right gastrocnemii did not contract with the strongest current which could be borne and the left only slightly, the current almost as strong, yet, in no other muscles was there anything like this degree of paralysis. This markedly unequal distribution of paralysis never occurs in peripheral neuritis, while it is the rule in poliomyelitis.

Hematomyelia is hardly in question because the history and the absence of active disturbances at the time of examination excluded a granulomatous affection of the anterior spinal roots which was also negatived by the paralysis not being of radicular distribution but conforming distinctly to the destruction of columns of cells found in poliomyelitis and hematomyelia.

A second case is a woman of thirty-eight also referred by Dr. Dunlop in January, 1911. On September 1, an attack which was called neuritis occurred. It consisted of a sudden pain in back of neck, shoulder, head, side, arm and leg. Speech became thick and the breath short; there was blurring of vision and falling of the left eyelid and mouth. Except for a pain in the shoulder the right side was free. There was no stiffness of the muscles, but on the contrary a relaxation so great that rising in bed was very difficult. After four days of fever the very severe pains ceased except in the neck which remained a month, as did a slight degree of fever. She had been wakeful, restless and delirious for about a week; she had vomited once after an anemia. There had been no urinary retention and no photophobia. She believes that the reflexes had never been lost.

Examination.—The deep reflexes were all exaggerated except Achilles, which was diminished. The Mendel is greater on the left side. The left plantar reflex is diminished, but the toes flex distinctly.

No loss of sensibility or muscular weakness was found with the exception of complete paralysis of the serratus magnus.

The electrical reactions of this muscle were completely absent. Those of the rhomboids appeared diminished, the left more so than the right, and the reaction of the left deltoid and triceps

required a stronger current than those of the right side, fifty on the Mackintosh scale being required for the deltoid and forty for the triceps. The faradic response for stimulating the nerves was hyperexcitable.

On inspection the left scapula was markedly tilted and the tilt was accentuated on raising and advancing the arm which she can do only imperfectly unless the scapula is artificially fixed.

It seems remarkable that after a history of so extensive an involvement to which too the cranial nerve nuclei had participated there should have remained no disorder but the paralysis of an individual muscle. Of course, the diagnosis of neuritis was out of the question for the sensory symptoms were too widespread for an inflammatory lesion confined to the long thoracic nerve, or even the brachial plexus. And they were not sufficiently widespread, being unilateral, for a polyneuritis which again never picks out an individual muscle for paralysis while sparing others. The case then was a unilateral polioencephalomyelitis which fell short of nuclear destruction except of the long chain of nuclei in the fifth, sixth and seventh cervical segments supplying the serratus magnus.

1758 K STREET.

PRUNE-JUICE VOMITING AS A SYMPTOM IN CYCLIC IN CHILDREN.*

BY

ROBERT S. MORRIS, M. D.,

[New York City.

IN place of a formal paper, I would like to call the attention of members who practise among children, to a symptom which has come to my notice, and which I have not been able to find described in pediatric literature—namely, “Prune-juice vomiting.” Prune-juice expectoration is universally recognized as pathognomonic of the first stage of pneumonia; so prune-juice vomiting may be characteristic of a form of cyclic vomiting or of catarrhal gastritis in children. While I have only seen a few cases well marked, yet I do not doubt that it is quite common, and if looked for, will be recognized. So far the cases that I have seen have been little girls from four to eight years of age.

The attack commences with ordinary vomiting of the stomach contents, then instead of ceasing, becomes persistent, and the stomach refuses to retain anything. The vomited matter consists at first merely of an acid, watery fluid with streaks and flakes of mucus, followed by the usual quantity of bile. After

* Read before the Lenox Medical and Surgical Soc., December 16, 1911.

twenty-four to thirty-six hours of this, the peculiar symptom appears. Many minute points of blood changed to a brownish color appear floating in fluid, these increase in number in successive vomiting spells until the whole appearance of the matter expelled is that of prune juice, or I might say tobacco juice. This phenomenon puzzled me and I have not been able to find a description of it in any literature on diseases of children.

In literature referring to recurrent or cyclical vomiting in children the symptoms are practically the same as in the cases that have come under my notice. One allusion to the presence of blood in the matter vomited is made in a paper published in the Archives of Pediatrics by Dr. B. K. Rachford, where reference is made to mucus sometimes tinged with blood in the vomited matter, *but in the cases I have seen the presence of blood is a characteristic symptom.* It could not occur from gastric ulcer and there is no evidence of gastric hemorrhage; the blood is not of a bright red color.

In a case described by Langmead, reported in the British Medical Journal, Feb., 1905; a girl in eight weeks had four attacks, when vomiting was almost incessant, but in the history of this case as reported, there is no allusion to the presence of blood in the vomited matter, although autopsy showed the mucous membrane of the posterior walls of the stomach to be mottled with dark red congested areas, making it apparent that the symptom must have been present but unobserved.

This condition lasts for two or three days, notwithstanding treatment. In fact, medication by the stomach seems useless. Large doses of bismuth have no effect and the patient being unable to digest any food, becomes emaciated and a source of great anxiety to the physician as well as to the family. There is slight pain in the epigastric region and an intense thirst. The patient has to be watched carefully to prevent her from drinking anything within reach. One little girl watched her chance and satisfied her thirst from an ice-water bag that had been applied.

The temperature in my cases has never been above normal. The physician when first called is apt to think lightly of such a case; that after the stomach and bowels are emptied the patient will naturally go on to recovery, and is surprised the next day to find the child worse, with the appearance of the small capillary hemorrhages after vomiting. The usual stomach remedies are prescribed without benefit.

I have found that a comparatively large dose of sodium bro-

mide thrown high up into the rectum has a generally quieting effect and allows the patient to have an interval of a few hours' rest. The patient's strength is rapidly lost after so many vomiting spells. I have given a hypodermatic injection of morphine from $1/32$ to $1/16$ grain. This is of great benefit and the patient will be much better after sleep and the accompanying quiet of the stomach. I have found that a nutrient enemata of peptonized milk, beef juice and whiskey aid greatly in keeping up the strength of the patient and in preventing the collapsed look that soon develops after continuous vomiting, and the inability to retain nourishment.

A peculiarity of this affection is that if a child once has it, other attacks may be expected after a period of several weeks. This will go on for a few years and then the child becomes less susceptible.

In catarrhal enteritis we see the evidences of capillary hemorrhage frequently, but so far it has not been noticed in gastritis except in toxic cases due to a strong irritant.

I was unable to determine any particular cause of this symptom in my cases—whether it was due to the possible migration of the colon bacillus to the stomach, or to eating while fatigued, or to atmospheric influence.

Irritability of the nervous system invariably accompanies the disturbance. There is tremor of the voluntary muscles upon slight exertion, and the patient may very rapidly develop an hysterical condition due to the necessary denial of fluids desired.

After the attack subsides the patient improves quickly and just here the physician should be very careful and not permit any solid food. Indeed, any nourishment but that of the lightest kind will be invariably followed by a relapse, with a retarded and more difficult recovery.

At the beginning of treatment washing out of the stomach would be in order, but as this is extremely difficult in a nervous child, the same result may be obtained by letting the child drink a glass of water with $1/2$ dram of sodium bicarbonate.

To prevent straining and to make vomiting easier this may be repeated whenever the nausea increases to the vomiting point. I do not believe in giving small pieces of ice as the thirst is increased thereby and the stomach frequently filled with a fluid of doubtful character from the possible impurity of melted ice.

Counter irritation over the epigastrium and abdominal region is sometimes of comfort and benefit.

Saline frequently alternated with nutrient enemata relieve the thirst and prevent the rapid emaciation of the patient. Cocaine hydrochlorate in small doses theoretically is indicated, but I have not given it a trial as yet.

Large doses of sodium bromide per rectum are usually retained and are of benefit. If this fails morphine hypodermatically is the last resort and so far has always been used with good effect.

I regret that I have never had a microscopic or chemical examination made of the matter vomited.

The characteristic color, that of prune juice or tobacco juice is probably caused by the influence of gastric secretion and the development of gases either from the stomach or intestines with the exudation of blood in minute points on the surface of the gastric mucous membrane; for I do not think that there is any solution of continuity of that surface because in no case has there been what could be called a hemorrhage or any "coffee grounds" matter in evidence.

149 WEST EIGHTY-EIGHTH STREET.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Stated Meeting, Held January 11, 1912.

DR. WILLIAM SHANNON *in the Chair.*

A CASE OF TORSION OF UTERINE ADNEXA IN HERNIA IN INFANTS.

DR. ALEXIS V. MOSCHCOWITZ presented this patient. He said it was accident, and perhaps the law of duplicity of cases, that enabled him to observe and operate upon two cases within a period of five months. Both were of a similar nature. Unfortunately he could present but the one case at this meeting, but the history of the two cases was practically the same.

The baby when five months old was admitted to Mount Sinai Hospital, March 25, 1911. On the day previous the patient was seen by Dr. Heiman; she had been taken to him for regulation of the diet. On examination Dr. Heiman found six toes on each foot; otherwise everything was normal. About nine hours before admission the child vomited and cried considerably and the mother noticed a swelling in the left groin. The child was again taken to Dr. Heiman, who promptly sent her to the hospital with the diagnosis of strangulated hernia. On admission the baby looked and acted as if she were well; the vomiting had ceased and she retained nourishment; the bowels moved spon-

taneously and by enema; the ejecta contained no blood; the pulse, temperature and respirations were normal. There was, however, a distinct swelling in the left groin, the size of a plum. Dr. Moschcowitz saw the baby within half an hour after admission and not only confirmed the diagnosis already made of a strangulated inguinal hernia but also made the more exact diagnosis, that the hernia contained either tube and ovary, or a portion of the uterus. At operation the sac was seen to emerge from the external inguinal ring; instead, however, of taking the usual course into the labium, the sac was reflected upward and outward; in other words, there was a perfect example of an inguino-superficial hernia. Upon opening the sac there was found the left tube and ovary, twisted in one complete revolution. After an uneventful recovery the baby was discharged cured and had remained well nine months after operation.

Five months after this a baby was brought to his office and a diagnosis of strangulated ovarian hernia was made. The child was admitted to Mount Sinai Hospital and operated on. He could not say with absolute certainty that there was any twist of the ovary in this case. An uneventful recovery followed in this case as well.

CASES SHOWING THE BENEFIT DERIVED FROM TREATMENT IN BIRTH (ERB'S) PARALYSIS.

DR. HENRY W. FRAUENTHAL presented these cases and photographs of others showing the results of but two or three weeks' treatment in some cases and in patients whose ages ranged from six months to twenty-two years.

The first patient shown had Erb's paralysis with a very frail arm; six months of treatment resulted in the patient having practically a normal range of motion although the part failed to get its normal growth. The condition of the arm was not the result of nonuse alone but the result largely of some interference which occurred in the muscles, an injury to the nerves, and this affected the bone growth.

The second patient Dr. Frauenthal presented was a lady, twenty-two years old, who had a claw hand. No attempts had ever been made to have anything done because she had been advised that nothing could be done for her relief. However, after three months' treatment at the hospital she showed a marked improvement in the muscles of the hand and arm. In the cases of claw hand, much could be done by education. The tone of her muscles had improved very much under the treatment employed and which he described in his paper. He hoped to be able to show her one year hence.

CASE OF CHRONIC COLITIS IN A CHILD THREE YEARS OF AGE WITH DEFORMITY AND DEVIATION OF THE SIGMOID FLEXURE.

DR. J. FINLEY BELL presented this patient who came under his care June 2, 1909, when about five months old. He had weighed

6 $\frac{1}{4}$ pounds at birth. He was nursed six weeks, then was on mixed feeding for two weeks, and finally was placed on modified milk. At three months he was exclusively on the modified formulæ found in Dr. Holt's small book. Up to the time Dr. Bell first saw him, he had never had a normal bowel movement. The child was very uncomfortable, crying a great deal. Notwithstanding all this he almost doubled his weight at the end of three months. During the month of May his weight decreased to between 9 and 10 pounds; he was dull, apathetic, at times amounting to stupor. Early in August he had a sharp attack of diarrhea, with stools containing a large amount of mucus. During the latter part of this month he had another similar attack. In September the symptoms became rapidly worse and as many as forty bowel movements a day were recorded. There was considerable pain and tenesmus. During the first days of this illness irrigations were tried, but only were occasionally successful, it being impossible to pass the tube higher than 6 inches. The irrigations had to be discontinued on account of the tenesmus. After two weeks he was put on whey and later on a whey top milk mixture on which he gained weight. He soon weighed 9 pounds. On October 15, goat's milk was successfully substituted for the whey top milk mixture. They were firmly convinced that in all cases of chronic digestive disturbances in children, this procedure should never be omitted.

TORSION OF UTERINE ADNEXA IN HERNIÆ OF NURSINGS.

DR. ALEXIS V. MOSCHCOWITZ said that the cases he had just reported were two of four cases in which an approximately correct diagnosis was made before operation. A subsequent search of the literature showed that this form of hernia was of unusual rarity. In 1905 Damianos made an incomplete résumé of this malady and collected twenty-four cases. Additional cases had since been reported, so that the total number including his own comprised forty. A study of these cases revealed a picture of remarkable uniformity; sufficient indeed, to enable one to make a diagnosis of this form of hernia with more than reasonable certainty. All cases of ovarian hernia in children, with acute symptoms, might be divided into three groups: 1. Those in which a torsion of the pedicle had been distinctly noted in the history. 2. Those in which no torsion was present. 3. Those in which a torsion of the pedicle had not been noted. Many, if not all, of the cases in the third group, were also cases of torsion of the pedicle but either the torsion was not noted, or it became untwisted in the course of manipulations of the more or less hurried operation upon infants of such tender age. The entire subject demanded discussion from three viewpoints, the presence of ovarian hernia in infants under one year, the question of torsion of the ovary, and the diagnosis.

The frequency of ovarian hernia in infants under one year and in childbearing adults was a striking phenomenon. In older

children, during puberty, and in virgins, ovarian hernia practically did not occur except as neglected cases from earliest infancy. This might be accounted for by the fact that in infants the ovary was normally an extrapelvic organ, and in childbearing women it became so during pregnancy. In speaking of the descent of the ovary Dr. Moschcowitz said that it descended only as far as the brim of the pelvis during intrauterine life, and remained there for a year or more; its subsequent descent was due first, to its own weight, and second, to the deepening of the pelvis. This explained why in early infancy the ovary was an extrapelvic organ, and was thus rendered more liable to enter a hernial sac. Furthermore the strongest predisposing cause for a hernia of the ovary was the fact that the sac was congenital. It was difficult to prove that a sac was congenital in the female. However it seemed that congenital hernia was as frequent in the female as in the male. The peculiar nature of the sac in many cases was such that it could be accounted for in no other way but that it was congenital. This statement was based on the fact that in a rather extensive experience, he had found two varieties of sacs in oblique inguinal hernia. In the one the sac merely followed the course of the round ligament, and was separable with great ease from it. In the other, and the more frequent form, the sac was of exceeding delicacy, and was so intimately adherent to the round ligament as to be practically inseparable from it; in other words the round ligament was covered by its normal peritoneum only. The former was an acquired hernia and the latter a congenital hernia.

The question of the torsion of the ovary in the hernial sac was as mooted as torsions of other organs. A prerequisite for all torsions appeared to be a disproportion in size between the twisting body and its pedicle. This disproportion was present to a perfect degree in the ovary. However small this organ might be it was large in comparison with the Fallopian tube, which practically formed the largest part of the pedicle. Schnitzler explains the torsion by the ingenious theory that the ovary could not pass easily through the disproportionately narrow inguinal canal; when, however, it did become engaged, its further propulsion could only be attained by a sort of corkscrew motion, which resulted in torsion. Payr explained the torsion as due to stasis of blood in the pedicle from whatever cause, compression, kinks, etc. When this occurred the thin-walled veins did not empty themselves as fast as thicker and less compressible arteries pumped the blood into the mass. As a consequence the veins at first became lengthened, and when the lengthening was no longer compensatory, the veins twisted around the firmer parts of the pedicle; in this manner the torsion was begun and continued.

The diagnosis of twisted pedicle in ovarian hernias in infants was made from the fact of the existence of a hernia; that it was strangulated was obvious. The diagnosis of the organ or organs contained in the sac could be reached by exclusion. The excel-

lent condition of the child and the freedom from bowel disturbance excluded involvement of the gut at once. There remained to be considered only the omentum, the uterus and the adnexa. The omentum was excluded by the extreme rarity of omental hernia in infants, because of its undue shortness at this age. The chances of the sac containing uterus, or the horn of a bicornuate uterus were considered improbable, owing to the extreme rarity of this condition and the comparative immobility of this organ. There remained nothing, therefore, but the tube and ovary. In his cases, Dr. Moschcowitz had not diagnosed torsion of the ovary because he did not appreciate at the time that torsion of the ovary practically always occurred in strangulations of this organ in herniæ of infants.

Of the forty cases reported, diagnosis was made by Quadflieg only, who had had the advantage of having operated upon a similar case a short time previously. The clinical picture was a characteristic ailment of the first year of life. Of the cases reported nineteen occurred on the left side and twenty on the right.

The clinical picture was practically identical with that described in the cases reported. Heegard's first case was, however, of unusual interest. The patient was four weeks old. Six days prior to admission to the hospital, a swelling was noted in the left inguinal region and a diagnosis of abscess was made. At operation a twisted tube and ovary were found and extirpated. Five weeks later the child was readmitted to the hospital, the mother having again noticed a swelling in the left inguinal region which increased on straining. An exploratory incision revealed the right ovary which had prolapsed through the left inguinal canal. In a case reported by Tubby both right and left adnexa were in the hernia.

As to treatment; if the case was of very recent origin gentle taxis might be tried; if this was not successful prompt operation was indicated. By prompt operation they might be able to save the prolapsed ovary by untwisting the torsion. Delay would mean an extirpation of the organ, but even with this sacrifice the prognosis might be said to be good.

DISCUSSION.

DR. JOHN DOUGLAS said that he had had two cases of hernia of the tube and ovary; one in a child five months old. The history of this case was published in the Medical and Surgical Reports of St. Luke's Hospital in 1909. This patient was admitted to the hospital with the diagnosis of a strangulated hernia and, as in Dr. Moschcowitz's case, the patient did not appear to be sick. The diagnosis made was strangulated omentum, and a hernia of the tube and ovary was not thought of. The patient made a good recovery.

DR. HENRY W. BERG asked what type of hernia they were considering; was it the classical femoral, or inguinal, or the

various types of ventral herniæ? It was very interesting to know that these herniæ of the tube and ovaries probably occurred more frequently than is generally supposed. It was of the utmost interest in hernia of the tube and ovary to be able to feel these in the hernial sac; the average practitioner, however, would not think of such a condition; feeling such a mass he naturally would think that he was dealing with some neoplasm especially since there were no symptoms of intestinal obstruction. It was in his opinion interesting to know that these were not extraordinary herniæ. Dr. Berg asked whether cases of femoral hernia rather than inguinal herniæ were more often complicated by the presence of the tube and ovary in the sac.

DR. ALEXIS V. MOSCHCOWITZ said that his two cases were inguinal herniæ and that practically all of the other cases that had been reported in the literature were of the inguinal variety. Unless he was mistaken there was but one cases of the femoral variety reported.

DR. JOHN DOUGLAS said that unless he was mistaken there had been reported in the literature by Andrews in 1907 ninety-nine cases of hernia of the tube and ovary but the majority of them were inguinal. There were five cases of the femoral variety, four obturator and two ischiatic herniæ.

DR. ALEXIS V. MOSCHCOWITZ, closing the discussion, said that he was only referring to herniæ which occurred in young infants, and he was not speaking of herniæ that occurred in adults. He referred specially to young nurslings and of the female sex.

(To be Concluded.)

TRANSACTIONS OF THE CHICAGO PEDIATRIC SOCIETY.

Regular meeting held November 21, 1911, with the President, DR.

JOHN M. DODSON, *in the Chair.*

CASES OF MIXED PARALYSIS.

DR. JOSEPH YOUNG.

M. K., aged twelve was well until an attack of Landry's paralysis from which he suffered at the age of five years. At seven years of age when he entered school he drooled incessantly, spoke very defectively, and could not use scissors or pencil because his arms were too spastic. At twelve years of age the paralysis of the arm has disappeared. Since his illness there has been spasticity and paresis of the right lower extremity and flaccidity of the left leg with hyperextension of the knee, lost reflexes, atrophy, and reaction of degeneration. The flaccidity of the left

leg is due to a lesion of the cord, the other findings being located in the bulb and cerebrum.

M. J., aged nine years, suffered from acute poliomyelitis when two years of age. Following this there was paralysis of the left upper eyelid and other muscles of the left side of the face, the left sternocleidomastoid and trapezius, and the left leg, especially the left peroneal muscles. Both knee-jerks were exaggerated there was a left Babinski, and clonus of the right Achilles tendon. There was no paralysis of the right side. The seventh and eleventh nerves were involved, producing flaccid paralysis due to involvement of the upper part of the lower neuron. Lesions of the pyramidal tract produced spastic paralysis of the peroneal muscles, and a cerebral or upper neuron lesion would account for the right ankle clonus.

E. M., aged nine years. The mother and child are both bleeders; the father and mother are alcoholics. Two sisters and two brothers died of convulsions in infancy. One uncle was an epileptic. The child is very nervous, has migraine, has never had a convulsion and cannot learn in school. Has never had a sickness or apparent injury. There is marked spasticity of the adductors of the right thigh which is $1\frac{1}{2}$ inches smaller in circumference than the left thigh. There is slight spasticity of the left leg. The right lower leg is flaccid, markedly everted, with extreme valgus of the foot. There is also calcaneus and pes cavus of this foot. The ankle is a flail joint, the calf muscles almost entirely atrophied. Both patellar reflexes are exaggerated. There is no Babinski, and no normal ankle jerk. There is reaction of degeneration of the right calf muscles. The mental defect, increase of patellar reflexes and spasticity of the legs are due to cerebral involvement. The atrophy and other findings of the right leg are due to involvement of the anterior horns of the lower lumbar and upper sacral segments, and are probably due to the fact that he is a bleeder.

A number of cases of spastic and flaccid paralysis have been reported in the literature, but with the exception of Erb's palsy which once or twice has been noted as occurring with spastic paralysis there have been hitherto no reports of the two types of paralysis occurring as the result of traumata at birth.

DISCUSSION.

DR. HENRY CHENEY.—How much has been done for the children in the way of treatment, and what is the line of treatment?

DR. YOUNG.—The little girl has never been treated. She was brought to the dispensary last week with the hope that something could be done. She saw Dr. Ridlon, and he said that in time she might have to wear a brace, but until the pes cavus is worse she does not need anything.

One of the boys wore a brace but it went to pieces and it has never been replaced. The other boy has not had any treatment. The two boys are in the school for crippled children; the little

girl is in the public school. Her mental condition is normal. The first boy made remarkable progress but the second boy did not make any progress at all. If he were in the hands of a good teacher like the first boy, he might make some progress.

DR. JOHN M. DODSON.—One of the most interesting things about these cases is the remarkable improvement in the first boy's condition. It certainly was a hopeless outlook at first, judging from Dr. Young's report. It seems to me that this society should lend itself energetically to some propaganda, pointing out to the public what can be done with such children as these. The child is a curse to itself and a burden to its parents and to the community. From the economic side it would be a splendid investment to pay more attention to the development of these children. Take the case of the first boy, apparently a hopeless imbecile, and bring him to the point where he will be self supporting and a credit to himself and to those around him. That is good work, and it should be encouraged. We need more schools like the Crippled Children's School and more teachers to develop these children, such as the one who developed this boy.

This sort of thing does not appeal to the general public. The people need to be taught the wisdom and the economy of providing for children of this sort. Through the public press we might bring the public to the proper point of view of cases of this sort.

CASE OF SUBCUTANEOUS INJECTION OF SMALL QUANTITIES OF
HUMAN BLOOD IN SPONTANEOUS HEMORRHAGE OF THE
NEWBORN.

A. W. MYERS, MILWAUKEE.

A case of very severe hemorrhage from the bowels and stomach in a newborn child is reported in which the subcutaneous injection of the untreated blood of the mother in two doses of 3 and 5 c.c. respectively, was followed by prompt cessation of the hemorrhage and complete recovery.

DISCUSSION.

DR. JOHN M. DODSON.—The deoxidation of the tissues which might come from chloroform or any other agent may be responsible for the destruction of the blood and the subsequent death. It would be interesting to study the relative frequency with which these hemorrhagic conditions occur in the newborn.

As for the relation of the chloroform during labor: Dr. Graham used chloroform in his experimental work on guinea-pigs and rabbits, and with relatively large doses he was able to produce striking pictures of hemorrhagic conditions in animals closely resembling von Winckel's disease. Those engaged in obstetric and pediatric work should have their attention called to this fact.

DR. C. G. GRULEE.—I had a case of hemorrhagic disease in the newborn but the diagnosis had not been made because there were no hemorrhages at the time. When I arrived the child

was vomiting some blood. I took 15 c.c. of blood from the father's arm and injected it into the child's buttocks. The child died in three hours. The reason was not the hemorrhage itself but the location of the hemorrhage since the only place where we could find physical signs were in the lungs. They were full of bubbling râles. We could hardly regard that as a criterion of what injection of blood would do in these cases.

Dr. Graham did some work in this respect and it was interesting. He grouped all these hemorrhagic conditions of the newborn with Buhl's disease. I remember that he told of one guinea-pig which he had anesthetized for thirty-five minutes twenty-four hours before the birth of the young; one of these showed typical von Winckel's disease, and the other, a typical Buhl's disease. It was most interesting.

Dr. Graham considered two possibilities in regard to chloroform narcosis. One was that the children suffer from delayed chloroform poisoning; the other was that chloroform narcosis produced a premature displacement of the placenta while the child was still in the uterus which in turn caused decreased oxidation. He thought the latter a more likely explanation of the condition than the former.

DR. A. C. SOPER.—I would like to voice a strong belief in the value of employing a healthy wet nurse having a baby two or three months old. Twelve hours after birth my second boy developed a melena. Chloroform was used for anesthetic on the mother for one hour before birth. The first boy was born with no abnormalities and the mother was two hours under chloroform, so that in that case it could be possible to rule out a connection between chloroform and melena. In the case of the second boy calcium chloride was administered within twelve hours, alternating per ora and per rectum, and six hours after the first dose the hemorrhages stopped. But I believe that the principal factor was that a healthy woman nursed the baby on the second day, and for four days. Her baby was about three months old and my boy got a number of healthy feedings before the mother was ready to nurse him. Apparently the serum of his mother's milk lacked some fibrin ferment or other quality, which was present in the milk of the other woman.

DR. JULIUS H. HESS.—I have seen two cases of direct transfusion from parent to child with practically the same result. Of course, this is a much more complicated method and requires complex surgery and apparently has very few advantages over simple injection. We have also heard much protest against the use of foreign serums when human serum can be obtained.

I want to record my experience with five cases. Three received ordinary doses of diphtheria antitoxin. That was about two years ago when antitoxin was not as concentrated as it is now. Two thousand units were used and recovery followed. More recently I had two cases in which I used cerebrospinal meningitis serum. In none of these cases has there been any sign of

anaphylaxis, although I have seen records of cases in which there were untoward results reported as due to the foreign serum. I have had no such experience myself.

A straight horse serum is now on the market to be used in these cases. I have also used serum in two cases of hemophilia with good result. One child had been injected twice with 70 c.c. of serum at an interval of about a year without any anaphylaxis.

DR. JOHN M. DODSON.—Of course, anaphylactic phenomena would not be likely to be seen until the serum was again injected. In the case of a child receiving a single injection of diphtheria serum, there is no reason to expect evidence of anaphylaxis; that is seen only when the serum is injected again, some years afterward. Few individuals suffer from anaphylaxis, but the prophylactic use of diphtheria antitoxin has been given up in some hospitals because of the possibility of anaphylaxis occurring when a second injection becomes necessary.

If Dr. Graham's idea is true, then the inhalation of oxygen is worth trying. These phenomena may be the result of deficient oxidation. The administration of alkalies is also worth trying. In one case I saw where the hemorrhage was slight the administration of adrenalin was effective. The hemorrhage ceased almost immediately. I ran across a very surprising statement in Holt's last book, in which he sets down the dose of adrenalin for this purpose at 3 grains. It seems to me that that is a large dose.

DR. HESS.—To answer the argument Dr. Dodson made in regard to anaphylaxis: In these cases several of the patients have had more than one dose, although given within six to twenty-four hours. In one case a single dose produced a marked urticaria, but in some cases nothing happened. In the Cleveland Hospital for babies they give antitoxin to all the children that enter. In 1906 the Boston General Hospital was doing the same thing. I inquired whether they were having any bad results, and in both cases their answer was "no."

I have taken serum six or seven times and the result was always disagreeable.

DR. SOPER.—I have not believed in prophylactic doses of diphtheria antitoxin for three years. During four years of work in the Chicago Half Orphan Asylum caring for over 150 children, I have had only fifteen cases of diphtheria, and at least 100 of these children go to public school. I never give immunizing doses of antitoxin. I often do not give antitoxin until I am sure from the laboratory report that the case is one of diphtheria. No one of the fifteen cases of diphtheria could be traced to any other case, and none occurred in the same groups of children consecutively. I now have a plan to get in touch with all children's hospitals and institutions of importance in the country and find out how many have abandoned the use of immunizing injections and how many have never given it at all. I do not believe that immunizing doses of antitoxin are necessary,

where careful isolation is practised and proper disinfectant precautions taken. This attitude of mine is in part supported by an article in the *Journal of Infectious Diseases* of about two years ago, by Geo. M. Weaver.

DR. JULIA D. MERRILL.—My first case of this disease in private practice—naturally clearly remembered—following a precipitate labor. There was scant time to clean hands and the labor was perfectly normal.

Beginning on the fourth day, hemorrhages from stomach, bowels, navel and under the skin appeared and persisted until death.

In weighing the value of any method of treatment, it is wise to recall that in this, as in most diseases, there are many grades of severity.

DR. J. J. GILL.—I have had two cases of hemorrhagic disease of the newborn. The first case was fatal; in the second a transfusion was done and the child was saved. Chloroform was used in both cases during delivery. In the first case about three drams of chloroform were used. The child died within twenty-four hours and at the postmortem a number of ulcers were found in the small bowel. The intestines were filled with blood and much blood had been vomited and appeared in the stools.

In the second case more chloroform had been used; the labor had been protracted for about twenty-four hours—a difficult forceps delivery. The child developed hemorrhages on the third day, vomited blood, several hemorrhagic spots appeared on the body and several bloody stools were passed. The child was transfused from the father and is alive today.

DR. H. F. HELMHOLTZ.—I would like to call attention to one point that might be of importance in clearing up the etiology of some of these cases. The liver of an animal subjected to chloroform contains very little if any fibrinogen. It would be of interest in these cases to see whether it is the fibrinogen that is lacking.

In a personal communication from Dr. Whipple who posted such a case in Baltimore, he stated that the fibrinogen was present but that the fibrin ferment was lacking. Blood was allowed to stand for over a week without any clotting taking place. It might be of interest if these cases could be studied from this point of view to find out which of the elements necessary for the clotting of blood is missing.

DR. MYERS, closing.—I am sorry that I did not have the pleasure of hearing Dr. Graham's paper. The theory of chloroform poisoning is one which at first sight appeared rather doubtful to me, yet I was quite surprised to find on looking up my notes that all the cases I had seen had received chloroform during the labor, although in some cases it was given for a very short period of time. I was interested to hear of Dr. Merrill's case where these hemorrhages occurred in a case where no chloroform had been used.

RUMPELL-LEEDE PHENOMENON OF SCARLET FEVER.

DR. MAY MICHAEL.

This sign consists of the production of hemorrhages on the anterior surface of the forearm when pressure is applied around the arm. Dr. Michael studied the phenomenon in 100 normal children. Two series of tests were made. In the first series pressure was exerted with an ordinary muslin bandage which was drawn tight enough to produce a decided blue discoloration of the forearm and left in place three to eight minutes. In the second series, a Riva Rocca blood pressure was used, the pressure raised to 60 mm. and kept there for ten minutes.

From this study the writer found that:

(1) Hemorrhages could be produced into the anterior surface of the elbow joint in practically all children by applying sufficient pressure around the arm.

(2) A pressure of 60 mm. applied for ten minutes will produce hemorrhages in 60 per cent. of normal children, but to a much more limited degree, than when greater pressure is exerted.

DISCUSSION.

DR. JOHN M. DODSON.—Is there any relation between the width of the constricting band used and the eruption?

DR. MICHAEL.—I do not think so. I used a 9 cm. band, the same as I have been using in blood pressure work and I used a wider band in a few cases, but it did not make any difference.

DR. I. A. ABT.—I saw this phenomenon produced in a number of scarlet fever cases by simply pinching the skin in the folds of the elbow. In nearly every case quite a purpuric spot was raised. I think that probably that would be more true in scarlet fever cases than in normal children.

DR. H. W. CHENEY.—During the past year several references have appeared in the literature about a new sign in scarlet fever consisting of linear markings in the fold of the elbow. No very definite description was given, and I have looked for the sign but have failed to find it. I wonder whether there is any relationship between the sensitiveness of the inner fold of the elbow and the appearance of the sign.

DR. C. G. GRULEE.—Can that be due to the toxic action of the scarlet fever poison on the blood-vessel wall when it can be produced in so many normal cases? It can hardly be regarded as a specific toxic action, I think.

DR. MICHAEL, closing.—The linear sign was described by a French writer and it is quite distinct from the hemorrhages. I have looked for it but could not find it. I agree with Dr. Grulee as to the toxic action on the blood-vessels. We must study these cases better before we can say that this is a scarlet fever phenomenon. Two of the children I examined have contracted scarlet fever since and the sign was very marked during the disease in one of them, more so than it was before, but in the other it was practically the same.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Prevention of Deafness in School Children.—P. Jacques (*Jour. de méd. de Paris*, September 30, 1911) says that great efforts should be made to place under treatment every case of nasopharyngeal inflammation in a young child as early as possible, since it is only necessary to investigate carefully the conditions among school children with reference to deafness to be convinced that most cases of deafness begin very early, in the presence of adenoids and enlarged tonsils, and that the changes are very slow and insidious in their appearance. It is only by a careful and systematic examination of such children that all the cases of deafness can be discovered. Only one ear may be affected at first, and thus deafness will not be noticed until the other has become involved. The prevention of deafness must begin early and must consist of treatment of the enlarged adenoids, and tonsils which cause the later condition of otitic sclerosis.

Fatal Jaundice of the New-born.—J. N. Morris (*Australian Med. Jour.*, 1911, i, 149) reports the occurrence of one mild and temporary and five fatal cases of jaundice among the ten children of one woman. The autopsy of the last case showed no obstruction of the bile-ducts but evidences of chronic inflammation of the lungs, liver and kidneys. The literature contains records of eight similar families. In these nine families there were seventy children, with fifty-nine cases of jaundice of whom forty-eight died. A study of the various histories brings out the following features: The parents were apparently perfectly healthy, and in no case was there any reason to suspect syphilis. Several writers emphasize the absence of a syphilitic history in the parents. The infants affected are in appearance and development apparently perfectly normal at birth. The jaundice is absent at birth, but sets in generally within twenty-four hours. The stools remain normal in appearance and are never pale, and the urine is never dark. The indications that the jaundice is of a grave nature are the onset of gastrointestinal symptoms, *e.g.*, loss of appetite, and vomiting, crying and moaning, more or less incessantly, with deepening coma. The first-born frequently escapes and healthy children may grow up in between the affected ones. The toxic agent, whatever its nature, seems to become more intense as the parents grow older, as evidenced by the shorter life of the latest-born infants. This is contrary to the usual course of events in syphilis; but the writer believes that the present case is either syphilitic in origin, or that syphilis has been grafted on to some other toxin, maternal in origin, but the nature of which is unknown.

Polyp of the Urinary Bladder.—Vesical tumors are rare in infants. For this reason I. S. Koll (*Ann. Surg.*, 1911, liv, 589) reports the removal from a boy of thirteen months of a polyp attached just below the internal urethral orifice. Here it had acted as a ball-valve, causing sudden stoppage of the flow after passage of a small amount of urine and leading to distention of the bladder.

Treatment of Chorea.—S. F. A. Charles (*Dublin Jour. Med. Sci.*, Nov. 1, 1911) advocates the use of frequently repeated doses of trional in the treatment of chorea.

Scarlatinal Nephritis.—In studying the cases of scarlatina at the Hospital of Hamburg, C. Leede (*Münch. med. Woch.*, Nov. 28, 1911) found that in a number of instances, early in the course of the disease, but after a prophylactic injection of antidiphtheritic serum had been given, a mild type of nephritis occurred, differing materially from the severe, hemorrhagic nephritis that is characteristic of scarlatina in its third week. The author believes that this shows that all cases of scarlatina affect the kidneys to some degree, as well as the heart and the capillaries in the skin. For this reason the kidney of a scarlet fever patient is vulnerable to the diphtheria antitoxin. Another factor in this nephritis may be a familial hereditary vulnerability of the kidney. The Wassermann reaction is twice as often positive in scarlet fever nephritis as in other scarlatina patients. Through this reaction is shown a disturbance of metabolism of the kidney and other parenchymatous organs. The nephritis by itself plays no important part in the presence of a positive Wassermann reaction. It is impossible to think that latent syphilis is the cause of the positive reaction in all the cases tested, although it may account for some of them.

Effect of Salvarsan on Congenital Syphilis.—L. R. DeBuys (*Arch. Pediatrics*, 1911, xxviii, 918) states that the best method of treatment of the luetic infant is through the mother's milk. If it then becomes necessary for further treatment, either mercury or injecting the baby with salvarsan may be resorted to, preferably the former. The treatment of the fetus through the mother is at present unsatisfactory. The intravenous route is the method of choice for larger children. When the veins are small they should be exposed for injection. When the veins are too small the intravenous method is impracticable. In injecting small children, and when it is necessary to expose the vein, a general anesthetic should be administered.

A. L. Wolbarst (*Amer. Med.*, 1911, n. s., vi, 486) records a case of congenital syphilis in an infant which was treated unsuccessfully by the administration of salvarsan to the mother. Death occurred two days after the injection.

Sigmoid Sinus and Jugular Bulb in Infancy.—W. C. Braislín (*Trans. Amer. Obst. Soc.*, 1911, xii, part ii, 421) says that the chief differences noted between the sigmoid sinus and jugular bulb of the new-born and the adult are: In the infant the sinus

is straighter and relatively as well as actually shorter, the jugular vein perforates the bone more directly, with less tortuosity, it is more readily accessible and hence more easily cleared. There is apparently little difference in the size of right and left bulbs in the new-born; though in the five-year-old child the difference between right and left may be established to as great an extent as in the adult. At five to six years the styloid process is merely a cartilaginous tubercle. The difference in the direction in the course of the facial nerve in the new-born and adult is due to the rapid postnasal development of the mastoid portion of the temporal. This, after birth, is rapidly built up around the nearly vertical portion of the facial. In other words, the course of the facial nerve as it is found at birth, remains, but the process of development of the mastoid by the superposition of bone to form the mastoid tip and the bony floor of the meatus, lengthens the Fallopian canal in its nearly vertical portion only. The points of difference in the jugular bulb and neighboring regions of infancy and adolescence worthy the surgeon's notice are: 1. The simple and more direct course and form of the sinus, bulb and vein. 2. The practical equality of size of both bulbs in the new-born. 3. The course of the facial, overlying the bulb as at subsequent years, but passing diagonally **backward** as well as downward through the mastoid.

Cerebrospinal Fluid in Acute Poliomyelitis.—J. G. Forbes (*Lancet*, Nov. 18, 1911) states that there can be little doubt of the value of lumbar puncture as an aid to diagnosis between cases of acute cerebrospinal meningitis and acute poliomyelitis of the meningeal type. In the former the fluid shows very unmistakable characters, marked turbidity, frequently coarse, purulent clot formation, a great excess of albumin, absence of dextrose, a copious cell deposit of polymorphonuclears, and easy recognition of the meningococcus both in the film preparations and cultures on serum.

Hernia in Children.—D. Drew (*Practitioner*, 1911, lxxxvii, 299) holds that all herniæ in children should be operated on at an early age. The operation is practically free from risk even in an infant of six months. All that is necessary is to isolate the sac and draw it well down and apply a ligature to the neck. In doing so it is well to remember that the peritoneum is a very delicate structure and that it is very loose, so that it is quite easy to drag it down too freely. It should always be drawn down to a limited extent, as it ensures that no pouch is left, but if it is done too energetically the apex of the bladder may appear and be included in the ligature.

Causes of Convulsions in Infancy and Childhood.—Eric Pritchard (*Clin. Jour.*, 1911, xxxix, 97) defines the determination of convulsions as depending on the reciprocal relationship existing between the exciting cause and the underlying condition of excitability of the nervous sphere. He classifies the chronic predisposing causes as including: (1) Conditions accompanied with

demonstrable lesions of the nervous sphere: (a) traumatic lesions, birth palsies, hemorrhages, etc., (b) syphilis, (c) hydrocephalus, (d) meningitis, (e) tumors, new growth, etc.; (2) conditions unaccompanied by demonstrable lesions of the nervous sphere: (a) spasmophilia, (b) epilepsy, (c) congenital and hereditary tendencies. Acute predisposing causes are: (1) Poisons admitted from without: (a) food poisons (ptomain, etc.) (b), drugs, such as strychnin, lead, arsenic; (2) poisons generated within: (a) specific infections, (b) products of intestinal putrefaction and decomposition, (c) products of defective internal metabolism. The most common exciting causes are painful impressions from (1) distended stomach, pyloric spasm, wind in the stomach; (2) enterospasm, colic, wind, fissures of the rectum or anus; (3) middle-ear trouble, distention of the middle ear from pent-up discharges; (4) sore gums and rupturing teeth; (5) calculi in the passage of the biliary or urinary systems; (6) irritation of the skin from dermatitis or parasites.

Dull and Backward Children.—A. F. Tredgold (*Med. Press*, Nov. 29, 1911) finds that backward school-children are divisible into two main groups, namely, those of (1) innate dullness, and (2) acquired dullness. The innately dull are usually sturdy, well grown, and in good physical health; but they have no capacity for book-learning, and the teacher finds the greatest difficulty in teaching them the most elementary abstract rules. Two things are essential for the proper education of this class. First, a modification of the school curriculum to suit their natural aptitudes, and second, more individual instruction. Those children whose backwardness is not the result of innate dullness, but of defective cerebral nutrition caused by an adverse environment, divide into three classes: those children who are backward through defective function or lack of opportunity; those whose backwardness arises from some partial blocking of the sensory avenues, such as defective vision or hearing, and it disappears upon removal of the cause; and those children whose mental development has been hindered by malnutrition or disease. In one respect medical inspection, as at present conducted, is distinctly disappointing. The prime concern of the educationalist after all is with mind. This being so, it seems matter for great regret that, while so much attention is being given to bodily conditions, so little attention is bestowed upon the condition and capacity of the mind. It is the exception to find any reference to the number and condition of the dull and backward children, or to the matter of intelligence, at all. Until the school medical officer concerns himself much more with mental conditions than he does at present, and until the physician and the pedagogue work together at this matter hand in hand, we shall never get the best results either from medical inspection or from education.

Operative Treatment of the Deformity of Pott's Disease.—Royal Whitman (*Am. Surg.*, 1911, liv, 841) says that operative

treatment should be especially indicated in early cases of disease in the thoracic region, in which the deformity may be easily corrected with but slight separation of the vertebral bodies; that Lange's method is mechanically the best, but that the metal splints should be replaced by bone of sufficient strength to serve as an immediate support, and which in process of absorption may stimulate a callus formation from the neighboring parts similar to that found in the natural cure. In a boy of nine years he removed a section of the tibia divided this longitudinally, and separating the muscles on each side of the vertebral column from the spinous processes and lateral masses and removing the tissue from between the spinous processes and freshening the bony surfaces, inserted half of the tibial bone at each side of the spinous processes. This was done while the spine was forcibly straightened. The muscles were sewed over the grafts and the wound closed. A Calot jacket was applied and to its contour a convex stretcher frame was adjusted. The patient died six weeks later of tuberculous meningitis. No autopsy was allowed. The bone grafts were firmly fixed. The writer thinks that in Allen's operation the implanted bone is too superficial and is unsymmetrically placed.

Sepsis in the Newborn from Bednar's Aphthæ.—Georg Linzenmeier (*Zent. f. Gyn.*, Dec. 16, 1911) finds in the occurrence of aphthous patches in the mouth of the new-born child a frequent cause of sepsis. Thanks to the use of asepsis in the care of the cord so general among midwives, sepsis resulting from infection of that region is rarely seen. The author gives histories of three cases observed by him, in which there was a marked sero-purulent discharge from the nose, and in the mouth were found diphtheritic patches on the palate, with a deep infiltrated condition of the tissues. Cultures made from this membrane showed that the Klebs-Loeffler bacillus was not the cause. In one case the same membrane was found in the esophagus and stomach. The causative organism was a streptococcus of hemolytic type, found both in the secretion and in the tissues. All three cases resulted fatally. Pediatricists are at one in thinking that the palate and mouth of the new-born infant are tender and should be carefully handled. The first appearance in these cases was small aphthous patches, which Bednar named aphthæ. As a prophylactic measure careful handling of the mouth and no rough treatment in washing out the mouth in the new-born infant is to be inculcated. If mucus is to be removed from the mouth and throat it is better to take the child by legs and nape of the neck, and by pressing the legs upward into the abdomen and the chin down, to press out of the nostrils any secretions that have been taken in during birth.

Experience with Albumin Milk.—The so-called albumin milk or Eiweissmilch recommended by Finkelstein is prepared as follows: One tablespoonful of essence of pepsin, or a rennet tablet, is added to a quart of milk which is warmed to 100° F.

After fifteen minutes the milk is well curdled; the whey is then poured off. The curds are placed in a muslin bag and allowed to drip two hours. The curds are then gently mashed through a hair sieve, twelve to fifteen times; at the same time one pint of boiled water is poured through the sieve. Then one pint of buttermilk is added. The mixture is then ready for the addition of the carbohydrates. Maltose is preferred and may be added, up to 7 per cent.; if this does not bring about an increase of weight, particularly if the baby is over 3 months old, 2 per cent. of flour is also added, which must be first cooked twenty minutes with a little water. The composition of albumin milk is proteid, 3 per cent.; fat, 2.5 per cent.; mineral salts, 0.4 per cent.; carbohydrates, lactose, 1.5 per cent., plus the percentage of maltose and flour added. J. M. Brady (*Jour. A. M. A.*, 1911, lvii, 1970) has given this food to eighteen cases of malnutrition and two of diarrhea, with favorable results in seventeen of the twenty cases. It appears that the reason that we can cause a gain in weight so rapidly in these run-down infants is the fact that we can incorporate in the mixture such a large carbohydrate percentage, without causing an intoxication.

Treatment of Diarrheas in Bottle-fed Infants.—Dissatisfied with the routine treatment of giving to every baby with a diarrhea a cathartic followed by a longer or shorter period of starvation, R. H. Dennett (*Med. Rec.*, Dec. 2, 1911) adopted the routine method of cutting off all sugar in every case of diarrhea and feeding boiled milk one-third, water two-thirds. In the vast majority of cases this controlled the diarrhea; but the writer does not feel sure that the absence of artificial sugar was the cause of the beneficial result. He concludes that: (1) Underfed, poorly nourished babies with diarrhea, do best on the milk and water mixture, boiled, without sugar. (2) Bad diarrheas, or those that do not improve upon these mixtures are benefited by Eiweissmilch. (3) Babies that have had repeated or prolonged attacks of diarrheas do best upon Eiweissmilch. (4) Older, well nourished babies with a diarrhea do best upon a barley gruel diet for a few days. (5) Infectious diarrheas, if seen early, should have a cathartic and starvation for forty-eight hours and no longer. The milk and water mixtures, boiled, or Eiweissmilch should then be given. (6) Cathartics should be given to babies with diarrhea, with great discretion.

Recurrent Jaundice, Splenomegaly, etc.—L. Guthrie (*Practitioner*, 1911, lxxxvii, 791) reports a case in a girl eleven years of age the chief features of which were: recurrent jaundice for a period of more than three years; pigmentation of the skin resembling that of Addison's disease; pyrexia associated with exacerbations of jaundice; splenomegaly; progressive simple anemia followed by recovery; hemorrhages from mucous surfaces; positive reactions to Von Pirquet's and Wassermann's tests for tuberculosis and syphilis respectively. Hemolysis (as in obstructive jaundice) was less readily induced by saline solution than in

normal blood. While somewhat resembling congenital familial jaundice or Addison's disease the writer regards this case as possibly one of hepatic cirrhosis and splenomegaly, without change in size of the liver.

Tuberculous Laryngitis in an Infant.—In reporting a case of tuberculous laryngitis in an infant of seventeen months and commenting upon the variety of this affection in children under ten, J. M. Hunt (*Med. Press.*, Dec. 6, 1911) expresses the opinion that probably its apparent infrequency is due to the difficulty of making a satisfactory laryngeal examination during life.

Pyloric Stenosis in Older Children.—Although numerous articles have been written on congenital hypertrophic pyloric stenosis and pyloric spasm in infants, little attention has been devoted to the condition as it appears in older children. E. E. Graham (*Amer. Jour. Dis. Child.*, 1911, ii, 407) says that pyloric stenosis is present in children and young adults more commonly than is supposed. The age at which it manifests itself depends on the degree of stenosis present. Pyloric stenosis may be latent for years. It is found by the surgeon during childhood and young adult life, and its early recognition by the physician is important from the standpoint of early medical or, if necessary, surgical treatment. The entire disappearance of all the classical symptoms of congenital hypertrophic stenosis, and the apparent health of the infant during its subsequent early childhood, suggest the probability of an absorption of the hypertrophy, especially as no gastric dilatation may develop later in life. The writer records a case of pyloric spasm in a boy aged six and one-half years, whose general health during infancy and childhood had been first-class until a few months before his death; who presented during the last few months of his life a typical picture of pyloric spasm; who came to autopsy, and in whom no disease of the pylorus or stomach was found post mortem. The writer thinks the case belongs to the group of so-called nervous vomiting, of reflex origin, associated primarily with malignant disease of the eye, and later, aggravated by metastasis in the liver. The primary operation was followed by entire cessation of vomiting, and a gain in weight. The sarcoma returned in the orbit, metastasis occurred in the liver and both these conditions caused a severe return of this gastroneurosis. The operation of cleaning out the orbit only slightly affected the vomiting; the boy was in a deplorably weak condition at the time of the operation, and the sarcoma of the liver was probably instrumental in causing a continuance of the vomiting, which persisted, although in a less degree, until his death.

Night-blindness with Peculiar Conjunctival Changes in Children.—This combination of symptoms, sometimes spoken of as Bitot's syndrome, is described by S. Stephenson (*Proc. Roy. Soc. Med.*, 1911, v, Sect. for Study Dis. Child., 28; *Brit. Jour. Child. Dis.*, 1911, viii, 529). The conjunctival changes are seldom seen except in that part of the ocular conjunctiva which is exposed

when the lids are open, the so-called interpalpebral zone. They usually affect both eyes, sometimes unequally. They occur as more or less triangular areas, often one on each side of the cornea, which are dry and look as if they had been bespattered with tiny particles of white foam. If the foam-like material is wiped away it is reproduced within twenty-four or thirty-six hours after complete removal. To the condition the name "epithelial xerosis" is commonly applied. The relationship between conjunctival changes and night-blindness is not invariable, but they often coexist. The writer has found that in children with xerosis, but without ascertainable night-blindness, there existed changes in the visual fields. These were of two kinds—viz., constant and inconstant. The former consisted in a reduction for the red and green fields. But that was not all, for the field for red was more shrunken than that for green, so that the former lay inside the latter, whereas under normal conditions the reverse should be the case. In three-fourths of the patients examined with reference to this point the transposition was complete, but in the others the two fields overlapped at one or more places. The second or inconstant change lay in a slight contraction of the limits of the field for white. Both in simple xerosis and in xerosis complicated with night-blindness, the fundus presented slight departures from the normal. Thus, the retinal reflexes were exaggerated, so that the fundus looked paler than usual, while, in addition, a semicircular jagged reflex was often to be observed close to the inner side of the optic disk. Most of the children examined appeared to be in good general health. Such appearances as otorrhea, large tonsils, opacities of the cornea, eruptions about face and ears, swollen upper lids, nasal catarrh, enlarged cervical glands, and synovitis of the larger joints were common among them. An anemia of chlorotic type was present. The syndrome was observed in only poor-class children and during summer and autumn. The writer ascribes it to the effect of glaring sunlight, with slightly defective nutrit on, indicated by the anemia, as a remote cause.

Treatment of Adenoids.—Baldenweck (*Jour. de méd. de Paris*, No. 50, 1911) says that symptoms commonly ascribed to adenoids occur with other affections. Examination should be both digital and by posterior rhinoscopy. Adenoids may be present and give no trouble; the symptoms are not always commensurate with the volume of growth present. They should never be removed unless giving symptoms, but then should be operated on without delay. Removal should always be followed by repeated treatment of the nasopharyngeal space; respiration through the nose and proper enunciation may need to be taught the patient anew.

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ORIGINAL COMMUNICATIONS.

A STUDY OF EXPERIMENTAL POISONING WITH CHLORAL HYDRATE, WITH REFERENCE TO ITS EFFECT ON THE LIVER AND KIDNEYS.*

BY

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(With chart and eight illustrations.)

INJURIES to the liver and kidneys produced by chloroform have been carefully studied in cases of delayed chloroform poisoning in man and in experimental poisoning in animals. Howland and Richards (*Jour. Exp. Med.*, 1909, xi, 344) were able to produce typical delayed chloroform poisoning in dogs and studied the lesions in the viscera and the changes in metabolism in these animals. The most characteristic anatomical changes were in the liver, and consisted of extensive necrosis in portions of the lobule surrounding the central veins and fatty degeneration in the peripheral portions of the lobules. In the kidneys they found fatty changes in the straight tubules and degeneration of the epithelium in the convoluted tubules and also some interstitial hemorrhages. Some experimenters regard the kidney changes as the more important, but in Howland and Richards' animals they were quite subsidiary to the lesions in the liver. These workers also found characteristic disturbances of metabolism; namely, an increase in the total nitrogen output; an increase in the sulphur, especially the neutral sulphur,

* Read at a meeting of the Society of the Alumni of the Sloane Maternity Hospital¹ January 26, 1912.

of the urine; an increase in creatin, and a decrease in creatinin. A diminution or complete disappearance of fibrinogen (Whipple and Hurwitz: *Jour. Exp. Med.*, 1911, vol. xiii, No. 1) from the blood of animals poisoned with chloroform has been observed by Whipple and others.

Recognizing the similarity of the liver lesions produced by chloroform to the lesions found in eclampsia, Cragin and Hull (*Jour. Am. Med. Assn.*, 1911, lvi, 5) concluded that the administration of chloroform might be very injurious to patients with eclampsia or the allied toxemias of pregnancy. They made an experimental study of the effects of ether on the liver and kidney and found that it produced no injuries of this type. As a result of these observations Dr. Cragin gave up the use of chloroform for patients admitted to the Sloane Hospital for Women who showed typical eclampsia or symptoms of severe toxemia. To control the convulsions he used chloral hydrate per rectum and vasomotor depressants. In cases where operative delivery was necessary ether was used as an anesthetic. He treated a series of twenty eclamptic patients who had had one or more convulsions in this way with only one death—a mortality of 5 per cent. as compared with 28 per cent. in 251 previous cases. Moreover, it seemed probable that a number of other cases with severe toxemia did not develop convulsions as they might have done under ordinary methods of treatment. While these results were very satisfactory clinically, it seemed possible that chloral hydrate might also have some injurious effect on the liver, and the experiments reported here were performed at Dr. Cragin's suggestion. The work was done in the laboratory of the Department of Clinical Pathology, Columbia University, through the courtesy of Professor F. C. Wood.

Chloral hydrate was introduced as an hypnotic by Liebreich in 1869. This compound is easily broken up into chloroform and formic acid by the action of heat and dilute alkalies, and Liebreich attributed its action to the slow formation of chloroform in the body. This theory was combated by Hammarsten and Tomaszewicz (*Archiv. f. allg. Phys.*, 1874, ix, 35) who were unable to detect chloroform in the blood or expired air from animals under chloral narcosis. It was soon afterward discovered by Musculus and Mering (*Ber. d. deutsch. chem. Gesell.*, 1875, viii, 640) that chloral hydrate was excreted in the urine, not broken down but in combination with glycuronic acid. Its physiological action is similar to chloroform but it differs in

being a more powerful vasomotor and cardiac depressant and acting less strongly upon the respiratory center. It is, moreover, stated in some text-books of pharmacology that it produces degenerative changes in the liver similar to those caused by chloroform. Numerous studies on metabolism after chloral ingestion have shown an increase in the excretion of nitrogen and neutral sulphur, though this is often delayed until one or two days after the administration of the drug (Harnack and Remertz, *Fortschr. d. Med.*, 1893, xi, 265). These studies, however, were made before the severity of the chloroform lesions had been recognized, and the animals were given small doses of chloral hydrate from which they promptly recovered.

In the following experiments it was attempted to produce the severest effects possible from chloral hydrate, and doses were given sufficient to produce surgical anesthesia. To do this large amounts of chloral must be used, and a number of animals died without recovering from the anesthesia; a sufficient number recovered, however, from which to study the condition of the liver and kidneys after a lapse of one or two days, the time at which the lesions from chloroform are most severe.

In the first series chloral hydrate was administered by stomach tube in 20 per cent. solution in an amount sufficient to produce deep anesthesia. The maximum effects were usually obtained half an hour after administration. As soon as the effect began to wear off, which usually occurred in from one to two hours after administration, further doses were given so that the animals were kept anesthetized for a long period. There were no demonstrable changes in the liver or kidneys of a series of four dogs so treated. The following protocol gives the total amounts administered to one of these animals:

Dog No. 6.—Weight 5.9 kilos.

First day 8.9 grams chloral hydrate. Anesthetic 6 hours.

Second day 12 grams chloral hydrate. Anesthetic 7 hours.

Third day 9 grams chloral hydrate. Anesthetic 7 hours.

Fourth day 13.5 grams chloral hydrate. Anesthetic 7 hours.

Fifth day 12 grams chloral hydrate. Anesthetic 6 hours.

Total—58.4 grams chloral hydrate. Anesthetic 33 hours.

For two days after the last anesthesia the animal appeared ill and refused food, but after that recovered and was killed on the ninth day, four days after the last anesthesia. Sections stained with hematoxylin and eosin showed no changes except slight congestion about the central veins. There were a few fine fat droplets in the central zones of the lobules and many in the epithelium

of the bile ducts. The kidneys showed considerable fat in the straight tubules of the medullary rays, but no other changes.

In another animal, which received much smaller amounts of chloral hydrate, definite fatty changes were found in the liver.

Dog No. 9.—Weight 7.1 kilos. On one day this animal was given 12.8 grams of chloral hydrate in divided doses and remained anesthetic 7 1/2 hours. On the sixth day the animal became ill and developed a diarrhea, and on the seventh day it died. At autopsy the liver appeared diffusely yellow with deep red dots representing the centers of the lobules. The kidneys appeared normal. Sections of the liver stained with Scharlach R showed extensive deposits of fat throughout the lobules, most marked in the cells about the central veins (Fig. 2). In sections stained with hematoxylin and eosin the cells about the central veins were vacuolated and somewhat shrunken but there was no necrosis (Fig. 4). There were a few lymphoid cells collected about the central veins. The kidney sections showed extensive fat deposits in the straight tubules of the medullary rays and a few fat droplets in some of the convoluted tubules. Sections stained with hematoxylin and eosin showed slight cloudy swelling in the convoluted tubules.

In a second series of nine animals the chloral hydrate was administered subcutaneously. The absorption of chloral hydrate from the subcutaneous tissues is apparently slow, and the maximum effect is not produced for an hour and it is more difficult to produce deep anesthesia without killing the animal. The effect of a single injection is more prolonged than that of one administration by stomach and may last eight hours or more. Four of the animals treated in this way showed practically no changes in the liver or kidneys.

Dog No. 17.—Weight 5 kilos.

First day 3.8 grams chloral hydrate. Slept 6 hours. Not anesthetic.

Second day 5 grams chloral hydrate. Deeply anesthetic for 7 1/2 hours. At one time artificial respiration required.

Third day 2.5 grams chloral hydrate subcutaneously. Anesthetic for 2 hours.

Total 11.3 grams chloral hydrate. Anesthetic 9 1/2 hours. On the fifth day the animal was killed with ether and autopsy performed immediately. The liver and kidneys appeared normal, and sections of the liver stained with Scharlach R showed a few fine fat droplets scattered through the lobules. In the kidneys there was a moderate amount of fat in the straight tubules of the medullary rays. There were no other changes.

Dog No. 18.—Weight 12.9 kilos.

First day 9 grams chloral hydrate subcutaneously. Slept most of the day.

Second day 9 grams chloral hydrate subcutaneously. Slept most of the day.

Third day 9 grams chloral hydrate subcutaneously. Slept most of the day.

Fourth day 9 grams chloral hydrate subcutaneously. Slept most of the day.

Fifth day 9 grams chloral hydrate subcutaneously. Slept most of the day.

Total 45 grams. Seventh day killed with ether and autopsy performed immediately. The liver and kidneys appeared normal. In sections of the liver, stained with Scharlach R, a few fine fat droplets were seen scattered through the lobules. These were most numerous in the cells about the central veins. The cells appeared shrunken and vacuolated in sections stained with hematoxylin and eosin, but their nuclei stained well. In the kidney there was marked fatty infiltration in the cells of the straight tubules. In sections stained with hematoxylin and eosin some cloudy swelling was seen in the convoluted tubules.

Five other animals which received chloral subcutaneously showed a definite excess of stainable fat in the liver. The one showing most marked changes was No. 15.

Dog No. 15.—Weight 7.7 kilos.

First day 7 grams subcutaneously. Slept most of the day. Not anesthetic.

Second day 7 grams subcutaneously. Slept most of the day. Not anesthetic.

Total 14 grams. Third day found dead in its cage.

The liver and kidneys appeared normal at autopsy. Sections of the liver stained with Scharlach R showed that all the liver cells contained numerous fine fat droplets, and about the central veins were a few with large droplets. Sections stained with hematoxylin and eosin showed a few shrunken, vacuolated cells about the central veins, the nuclei of which stained well. The central veins and adjoining capillaries were distended. There were no other changes. The kidneys showed fat droplets in a few of the straight tubules, and the hematoxylin-eosin sections showed considerable albuminous exudate in the tubules. There was slight cloudy swelling of the tubular epithelium.

In order to determine whether there was any temporary change in the liver not detected on killing the animal several days after poisoning, in dog 13 portions of the liver were removed under ether anesthesia before and the three days following the administration of chloral. The first day this animal was given 18 grams chloral hydrate and was anesthetic seven hours. There were no marked changes in the liver on any of the four days. On the second day after chloral a few fat droplets could be seen in the

central cells. These were more numerous in the specimen taken the following day.

In order to test the effects of chronic poisoning with this drug, chloral was given to a normal dog with its food over a period of three months. From 2 to 15 grams were given a day, making a total of 680 grams. It occasionally had to be omitted when food was refused. At the end of the period the animal was killed and no changes were found in the liver or kidneys.

One dog was treated with chloral hydrate intravenously and one dog with injections per rectum without producing lesions of importance.

A large amount of stainable fat was found in the straight tubules of most of the animals poisoned with chloral. This condition is not uncommon in normal animals (Fig. 5). It was, however, so frequent in the dogs in this series that it seemed that the chloral might be a causative factor. To determine this one kidney was removed from a normal dog, and chloral was administered in large doses subcutaneously and per rectum.

Dog No. 26.—Weight 5.5 kilos.

First day, right kidney removed under ether anesthesia.

Second day, animal appears normal. Six grams of chloral per rectum, 2 grams subcutaneously. Anesthetic 9 hours.

Third day, 5 grams of chloral per rectum and 1.25 grams subcutaneously. In deep sleep but not completely. Anesthetic 12 hours.

Fourth day, still asleep and practically anesthetic. Died 25 hours after second administration of chloral. Total, 14.25 grams. Anesthetic 34 hours.

The kidney removed at operation showed a few fine fat droplets in the convoluted tubules, none in the collecting tubules. There was marked parenchymatous degeneration in the convoluted tubules. The kidney removed postmortem showed the same condition, in fact the microscopic sections of the two were practically indistinguishable. The liver showed large fat droplets scattered regularly throughout the tissue without relation to the lobular arrangement. The central veins were much dilated and there were a few small hemorrhages about them. The neighboring parenchyma cells were shrunken but not necrotic.

SUMMARY OF HISTOLOGICAL FINDINGS.

Liver.—In a series of twenty-six dogs poisoned in various ways by chloral hydrate only six were found whose livers showed definite pathological changes. These changes consisted in the appearance of fat in the liver cells, the change being either restricted to the central zone or affecting the whole lobule evenly.

None of the livers showed necrosis of the cells about the central veins,—the lesion which is the most characteristic of chronic chloroform poisoning. In Fig. 1 is shown the liver of a dog poisoned with chloroform, which showed moderately severe lesions. The section is stained for fat, which is seen to be most plentiful in the mid-zone of the lobule. In Fig. 2 is a similar section from dog 9 which showed the most severe lesions of any in the chloral series.

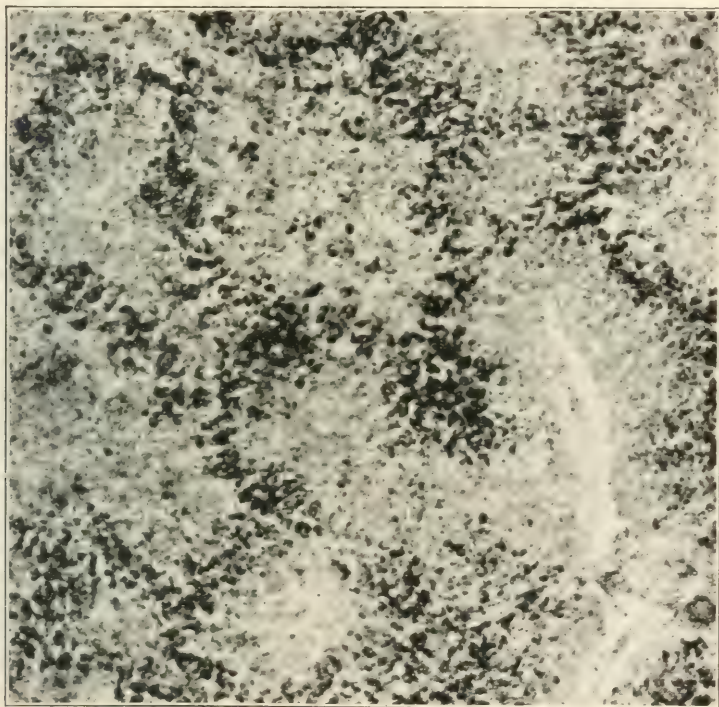


FIG. 1.—Liver, chloroform dog, No. 3; Scharlach R., 50 diameters. Shows fat deposits, most marked in the middle zone of the lobules.—(Cragin and Hull.)

In this section there is much less fat and it is most abundant in the cells of the central zone. Fig. 3, which shows the central zone in one of the lobules of the first liver, shows almost complete disappearance of the parenchyma cells. Only a few vacuolated cells with shrunken pyknotic nuclei remain between the endothelium of the intralobular capillaries. Fig. 4 shows a corresponding area in the liver of dog 9. The parenchyma cells contain many medium-sized vacuoles representing fat, but otherwise appear normal.

In regard to the other twenty dogs, most of them showed a

few fine fat droplets scattered through the lobules but not in sufficient number to be definitely abnormal. It could not be determined what occasioned the production of fatty changes after chloral hydrate. All except one of the animals which showed lesions were given the drug subcutaneously. The severity of the lesion seems to bear no relation to the amount administered or the depth of anesthesia. Dog 18, which received in all 45 grams subcutaneously, and another animal (dog 25, p. 571) which was in deep coma after subcutaneous administration of the drug, showed no change whatever in the liver. It is possible that

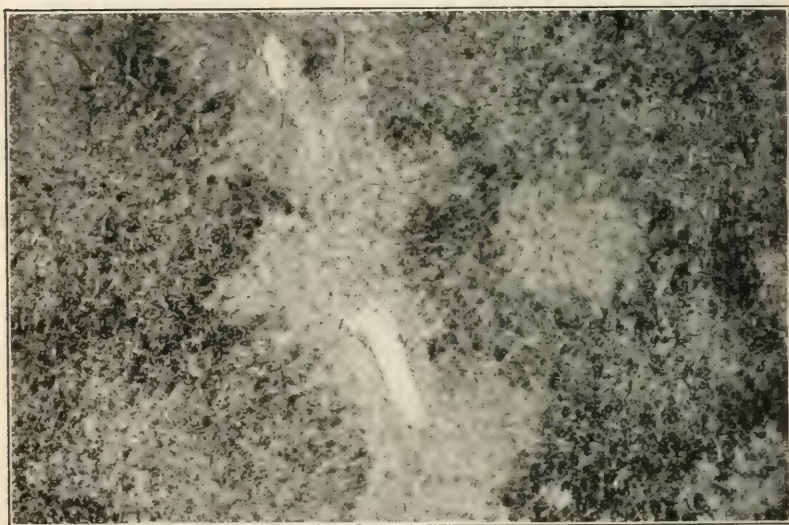


FIG. 2.—Liver, chloral dog, No. 9; Scharlach R., 50 diameters. Shows fat deposits, most marked in central lobules. Contrast with Fig. 1.

these changes were due to the partial breaking down of chloral to chloroform in these animals, but it would be difficult to prove such an hypothesis.

The fatty degeneration found in the central zones of dog 9 corresponds to the early stage of the injury produced by chloroform. In animals poisoned with chloroform the zone of fatty infiltration lies between the necrotic cells at the center of the lobule and the normal cells at the periphery, and apparently represents the early stage of an injury which eventually leads to necrosis. It would seem true that in occasional instances chloral may produce changes in the liver of the same type as those pro-

duced by small doses of chloroform, but not comparable in severity to the changes in typical chronic chloroform poisoning.

Kidney.—The kidneys of normal dogs, and probably of man, contain stainable fat in the epithelium of the straight tubules of the medullary rays (Fig. 5). This is increased after a full meal and diminished after starvation. It is increased in phosphorus poisoning. (Wisskirchen, *Frank. Zeit. f. Path.*, 1910, iv, Heft

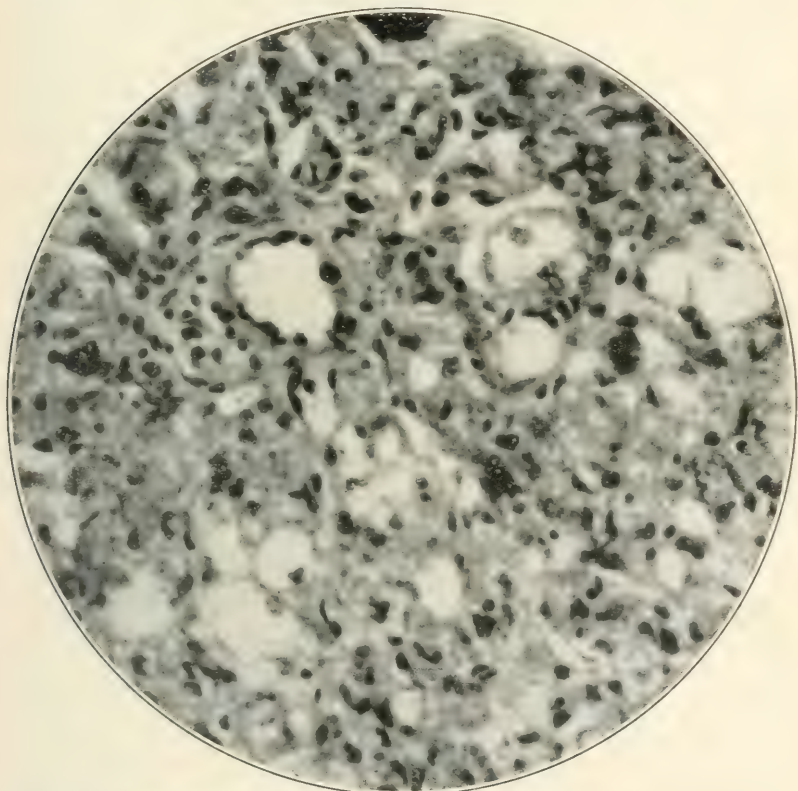


FIG. 3.—Liver, chloroform dog, No. 3; hematoxylin and eosin, 300 diameters. Shows central zone of one lobule. There is almost complete necrosis of parenchyma. A few liver cells remain with pyknotic nuclei crowded to one side by large vacuoles.—(Cragin and Hull.)

3.) In dog 26 no difference could be observed between the kidney removed before administration of chloral and the one examined after poisoning. Moreover, in dog 6 after heavy dosage with chloral the kidneys were absolutely normal (Fig. 6). The kidneys of street dogs used for laboratory work usually show some cloudy swelling in the epithelium, and it seems that very little

weight can be attached to the inconstant finding of such changes in these experiments.

EFFECT ON NITROGEN METABOLISM.

Poisoning with chloroform produces characteristic disturbances in metabolism, the most marked of which is an increase in the nitrogen output. This indicates an increased destruction of body protein and may be an index of the degenerative changes pro-

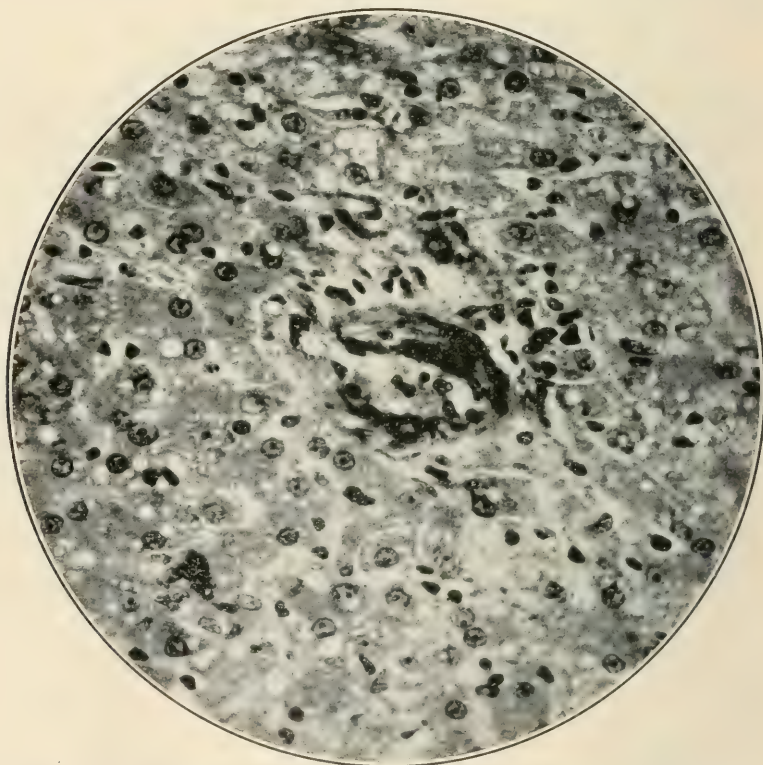


FIG. 4.—Liver, chloral dog, No. 9; hematoxylin and eosin, 300 diameters. Shows central zone of one lobule. There is no necrosis. The parenchyma cells are somewhat vacuolated (fatty), but otherwise normal.

duced. It would be impossible to study accurately this factor in animals in nitrogenous equilibrium as the dogs of course receive no nourishment during the anesthesia and usually refuse food the following day. It has been observed by Voit and others that the nitrogen output of starving dogs is practically constant after the first day of starvation. In the following experiments the animals



FIG. 5.—Kidney, normal dog; Scharlach R., 15 diameters. Shows marked fatty deposits in straight tubules.

were starved for one or two days before beginning the determinations and through the remainder of the experiment. They were given water ad libitum. They were catheterized daily at the same hour and the remainder of the urine collected in suitable cages. The amount of nitrogen was determined by the Kjeldahl method.

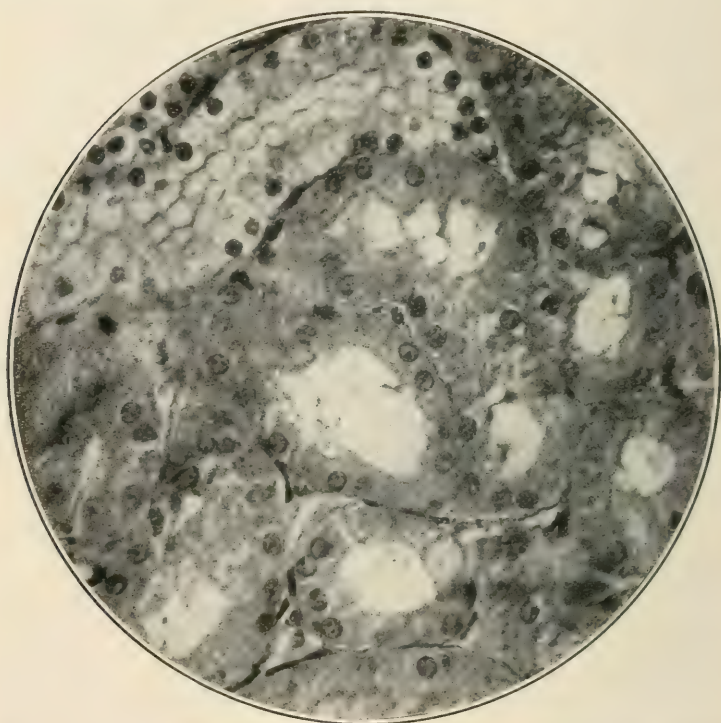


FIG. 6.—Kidney, chloral dog, No. 18; hematoxylin and eosin, 300 diameters. Parenchymatous degeneration of epithelium of convoluted tubules. Granular exudate in lumina. Straight tubule on the left shows fat vacuoles.

Dog No. 9.—Weight 7.1 kilos. This animal showed anatomically the most severe lesions that were found in the series (Fig. 9). The low figures indicate that the nitrogen intake before beginning the experiment had been low.

First day, normal.	Nitrogen	.77 grams.
Second day, chloral 12.8 by stomach.	Nitrogen	2.63 grams.
Anesthetic 7 1/2 hours.		
Fourth day,	Nitrogen	1.23 grams.
Fifth day,	Nitrogen	1.04 grams.
Sixth and seventh days urine contaminated with feces.		

Dog No. 11.—Weight 7 kilos. This animal appeared very susceptible to the drug and a small dose produced long anesthesia.

First day, normal. Nitrogen 2.72 grams.

Second day, chloral 5.5 grams by stomach Nitrogen 3.24 grams.

Anesthetic 7 hours.

Fourth day, Nitrogen 3.47 grams.

Fifth day, Nitrogen 2.10 grams.

Sixth day, Nitrogen 2.83 grams.

Dog No. 22.—Weight 8 kilos. This dog was given chloral hydrate subcutaneously and died during the second chloral day.

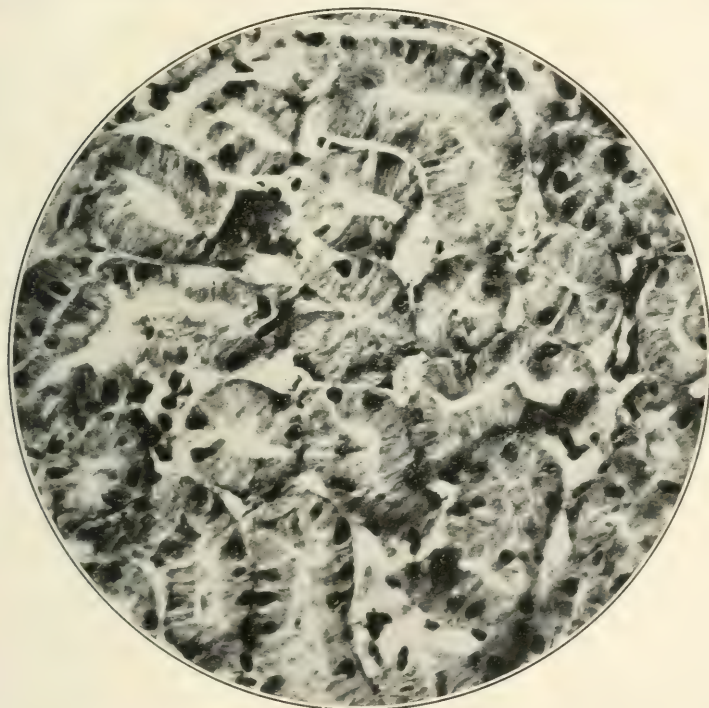


FIG. 7.—Kidney, chloral dog, No. 6; hematoxylin and eosin, 300 diameters. This dog received immense doses of chloral (p. 559), but tubules are absolutely normal.

It showed moderate increase of stainable fat in the liver.

First day, normal. Nitrogen .78 grams.

Second day, chloral 11 grams subcutaneously. Nitrogen .62 grams.

Anesthetic 8 hours.

Dog No. 23.—Weight 15.4 kilos. This dog was also given chloral subcutaneously. As the anesthesia effect was delayed the dose was increased. The animal then went into deep anesthesia and died the following day without recovering consciousness.

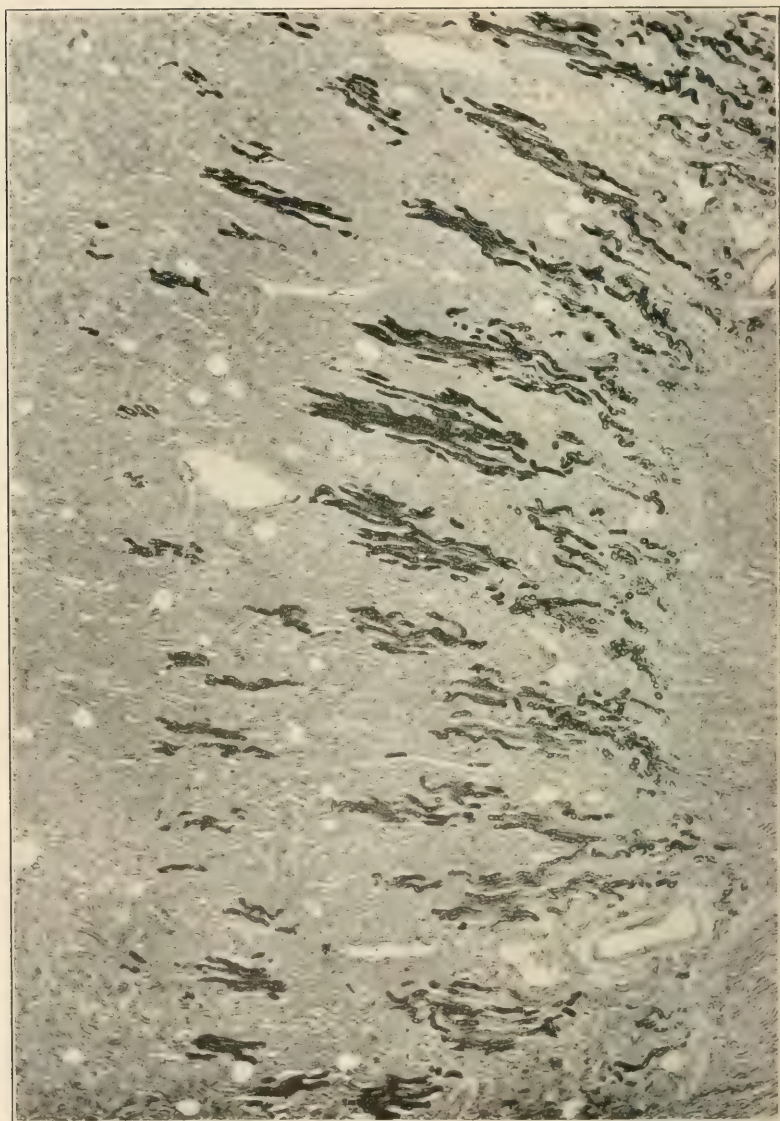


FIG. 8.—Chloral dog, No. 18; Scharlach R., 15 diameters. Fatty deposit in straight tubules only slightly in excess of that shown in Fig. 5.

First day, normal.

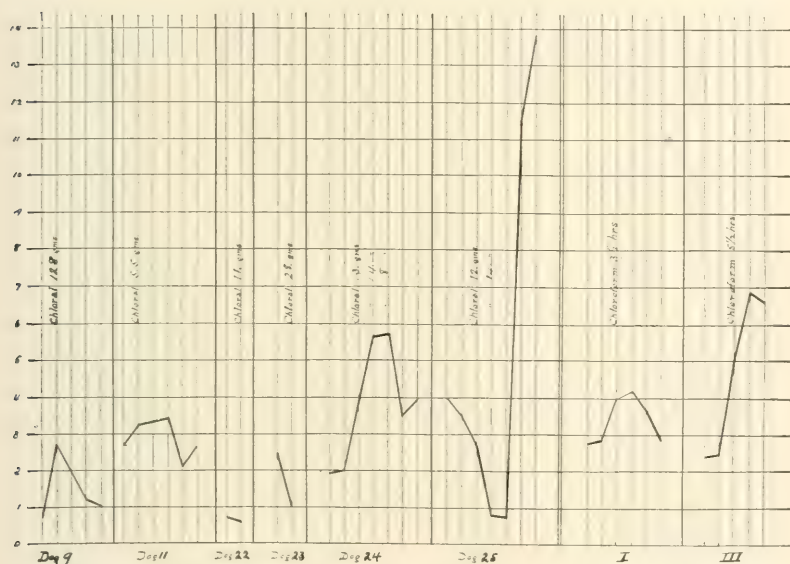
Nitrogen 2.4 grams.

Second day, chloral 28 grams subcutaneously.

Nitrogen 1.0 grams.

Anesthetic 9 hours.

Dog No. 24.—Weight 11.6 kilos. This animal was given large doses of chloral hydrate both subcutaneously and per rectum on three successive days. The total amount was 35 grams. It was deeply anesthetic about three hours each day and asleep three to six hours more. It recovered completely and was killed three days after the last anesthesia. In the liver there was moderate



Nitrogen excretion in chloral hydrate poisoning.

Nitrogen excretion in chloroform poisoning. (After Howland and Richards.)

fatty infiltration of the cells in the central zones, but no necrosis. The kidneys showed the usual fat deposits in the collecting tubules and cloudy swelling of the convoluted tubules.

First day, normal.

Nitrogen, 1.95 grams.

Second day, normal.

Nitrogen, 2.03 grams.

Third day, chloral 13 grams.

Nitrogen, 3.89 grams.

Fourth day, chloral 14 grams.

Nitrogen, 5.63 grams.

Fifth day, chloral 8 grams.

Nitrogen, 5.70 grams.

Sixth day,

Nitrogen, 3.51 grams.

Seventh day,

Nitrogen, 3.93 grams.

Dog No. 25.—Weight 13.7 kilos. This animal received large doses of chloral hydrate subcutaneously and by rectum on two successive days. The first day it slept heavily for over five hours, but was not completely anesthetic. The second day it was

under deep anesthesia for over twelve hours. Its respirations were very slow and shallow and several times artificial respiration was required. The next day it was conscious and the second day appeared weak and apathetic but otherwise normal. It was killed at the end of the third day after anesthesia. The liver appeared absolutely normal. The kidney showed fat in the collecting tubules and parenchymatous degeneration in the convoluted tubules. On the two chloral days the nitrogen output was much diminished, but on the second and third days after poisoning there was marked polyuria and extreme increase in the nitrogen excretion.

First day, normal.	Nitrogen, 4.00 grams.
Second day, normal.	Nitrogen, 3.55 grams.
Third day, chloral 12 grams.	Nitrogen, 2.66 grams.
Fourth day, chloral 14 grams.	Nitrogen, 0.81 grams.
Fifth day,	Nitrogen, 0.78 grams.
Sixth day,	Nitrogen, 11.52 grams.
Seventh day,	Nitrogen, 13.73 grams.

SUMMARY OF METABOLISM EXPERIMENTS.

The nitrogen output of dogs 9, 11, and 24 was increased during the chloral hydrate poisoning and returned afterward practically to normal. The curve corresponds fairly well to that of one of Howland and Richards' animals with mild chloroform poisoning. It should be contrasted with that from their dog with fatal chloroform poisoning, in which the output was increased during the poisoning and continued to rise until the animal died.

Chloroform, Dog. III. Weight 8.5 kilos (Howland and Richards, *loc. cit.*).

First day, normal.	Nitrogen 2.42 grams.
Second day, normal.	Nitrogen 2.45 grams.
Third day, chloroform anesthesia	
hours.	Nitrogen 5.07 grams.
Fourth day,	Nitrogen 6.87 grams.
Fifth day, death in coma.	Nitrogen 6.65 grams.

Dogs 22 and 23 in this series which died of acute chloral hydrate poisoning excreted less nitrogen after than before administration of the drug. Dog 25 which was very severely poisoned but subsequently recovered showed diminished nitrogen output during the anesthesia, followed by an enormous increase during the after-period. The animal's condition improved strikingly as the nitrogen excretion increased, and this increase cannot be considered an indication of progressive degenerative changes in the viscera in view of the negative autopsy findings. It has been noted by Harnack and Remertz (*loc. cit.*) and others that the

increased nitrogen excretion due to chloral hydrate may be delayed until two or more days after administration of the drug. These determinations seem to indicate that chloral hydrate causes an increased breaking down of body protein, but that the excretion of the end-products may in some cases be delayed possibly on account of the extreme vasomotor depression. In three of the animals the nitrogen excretion fell promptly to approximately the normal level.

So far as symptoms are characteristic, none of the animals showed the typical picture of delayed chloroform poisoning, with coma, jaundice, and convulsions. Two of the animals which recovered from anesthesia subsequently succumbed to the late effects of the drug. One of these, No. 9, went into coma but had no convulsions, no jaundice, and no hemtemesis. Those which were killed were all showing gradual improvement. So far as was noted without making special tests, the blood in all cases formed a firm coagulum promptly.

Conclusions.—We may conclude, then, from these experiments (1) that chloral hydrate may occasionally produce fatty changes in the liver similar to those caused by small doses of chloroform; (2) that it is impossible to produce by administration of chloral hydrate necroses in the liver similar to those found in delayed chloroform poisoning and eclampsia; (3) that chloral hydrate produces no histological changes in the kidneys; and (4) that chloral hydrate causes an increase in the urinary nitrogen which may be delayed until after recovery from anesthesia and tends to return again to normal.

LYMPHANGIOMA OF THE FALLOPIAN TUBE.

BY

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Portland, Maine.

(With three illustrations.)

TRUE lymphangioma of the Fallopian tube is a most infrequent pathological finding and for that reason only a small amount of literature has appeared on this subject and few cases have been accurately described. As far as I know, from a survey of the writings which pertain to this subject, only four cases have previously been published, although quite recently a case located in the broad ligament has been cited by Todyo, a Japanese patholo-

gist. The exactness of the pathological findings combined with other interesting conditions similar to those which have been found in the aforementioned four cases and incidentally in the case which I shall presently describe, warrants its further description as having direct bearing on the subject of this paper.

Hektoen and Riesman, in their excellent pathology, give a classification of lymphangiomas which I think is the most preferable of all. They state that lymphangiomas are of two varieties: (a) "true tumors in which a new growth of lymph vessels takes place" and (b) "those which arise from dilatations of pre-existing lymph channels or from their hypertrophy." However, it suffices to say that a lymphangioma is a tumor, primary in origin, derived from and composed of newly developed lymph-vessels, generally well circumscribed as a definite tumor mass.

Histologically a lymphangioma is recognized by its resemblance to lymph-vessels or lymph spaces found in normal, healthy tissue. We see a series of communicating clefts lined with endothelium and separated by connective tissue well supplied with cells, in which lymphocytes often abound. While a circumscribed lymphangiectasis may correctly be called a lymphangioma, as mentioned above in the classification, a true lymphangioma is recognized as being composed of newly formed lymph-vessels.

In lymphangiomas the growth is probably benign, as a rule, but it is fairly well agreed upon that they do sometimes take on malignant changes.

The presence of a large amount of newly formed endothelial elements arranged in such a manner as to simulate malignancy, has prompted this belief by its several observers, and also because it resembles an "endothelioma" in its microscopical picture.

Lymphangioma itself is not a rare tumor, except as it differs in its location in the body. While common in the skin and subcutaneous tissues it is most rarely seen in the digestive tract and even more infrequently found in the peritoneum or viscera.

The case at hand is one that was found during examination of the vast amount of material available in the Schauta Klinik, Vienna, and it is by the kind permission of Hofrat Prof. Schauta, that I present this case. May I also state that this case was recently briefly demonstrated in the Vienna Gynecological Society by Dr. Oskar Frankl, but the rarity of such cases allows

a more exact description than Dr. Frankl was able to give it on that occasion.

The patient was a woman of thirty-eight years of age who had suffered with menorrhagia and metrorrhagia for an extended length of time, and came to the hospital in a condition which may be easily imagined in a case of like history. She was pale weak, and decidedly anemic. Further details are unnecessary and of no importance. A large tumor was diagnosed, seemingly a fibroid and abdominal section was later performed.

In the gross pathological examination the uterus was found to be enlarged considerably and the uterine wall much thickened. At the left side of the uterine body was inserted a large fibromyoma of probable interstitial origin and showing centrifugal growth. Later histological examination failed to reveal any degeneration whatsoever.

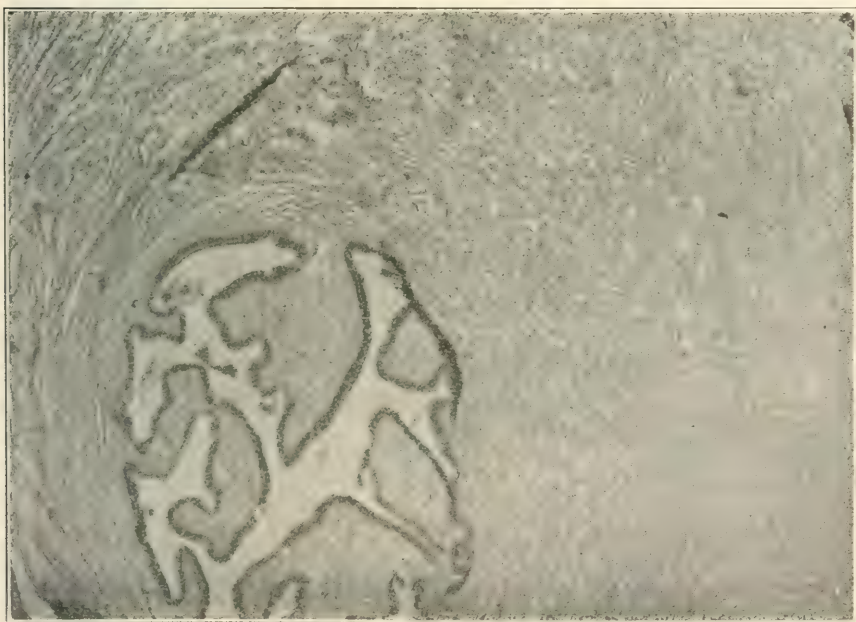


FIG. 1.

The uterine mucous membrane was 4 mm. thick, very soft and gray in color. The left tube was a little longer than normal and at the abdominal end one found two small fimbria cysts, the size of peas. A small ovarian cyst, the size of a walnut was present in the left ovary. In the exact middle of the left tube could be seen a small swelling not quite as large as a pea, and on palpation it was hard and resistant. Its situation was inside the upper wall of the tube; transparent through the tubal peritoneum, but not situated immediately under the peritoneum.

The microscopical examination reveals the following tissue findings and reference may be made to the three microphotographic reproductions.

The tubal lumen is normal showing regular folds. The section is taken from the middle of the tube. At one side may be seen the lymphangioma.

This picture shows the lymphangiomatous area very clearly with round cell infiltration at the peripheral surface. External



FIG. 2.

to this is seen some flat muscle fibers. One will notice that the lymphangiomatous tissue is made up of loose connective tissue filled with many cavities or crypts. Some small bundles of displaced muscles and frequently capillaries are seen in this area. Outside the field are larger capillaries also.

This shows a most interesting picture, stained by the Von Gieson method and photographed with high power through a Zeiss objective No. ee. Note the single endothelial layer of the cavities; some other sections that I made showed more than one layer; however, these I believe to be oblique sections. This is an important point in the discussion of the findings described

by authors of similar papers, as far as the question of malignancy is concerned.

One single differential point which may be questioned is whether these cavities are true lymphatic vessels or may be only fat cells. This is easily proven by the following fact. We know that one may extract fat droplets from fat cells and the resulting picture will be a cell with a single peripheral nucleus, while these cavities are seen to be lined up with a single regular line of endothelial cells.

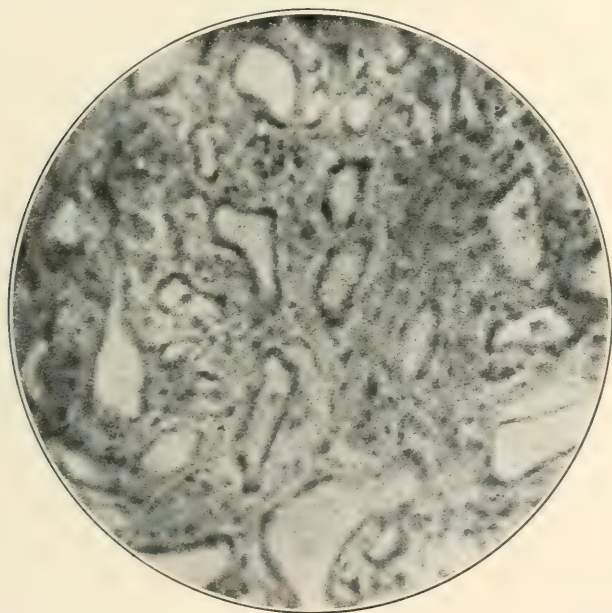


FIG. 3.

I think it to be a true tumor; a true lymphangioma, and base this decision on the quality and quantity of the lymphatic spaces. This tumor shows no signs of malignancy and all the cases of which I shall immediately present brief extracts, have shown unmistakable signs, according to the reports of their authors. This tumor is the smallest lymphangioma that has yet been described, even smaller than a pea. It is in its infancy and while it is interesting to note that it shows no malignant change I do not doubt were it more advanced in growth, it would proliferate and take on malignant formation. It is truly the youngest and earliest stage of lymphangioma.

Following are extracts from the descriptions of cases of lymphangioma previously reported by Hohne, Dienst, Kermauner and Franz, with the addition of Todyo's case because of its similarity. These reports are unique inasmuch as they all occurred in conjunction with uterine myomata.

In 1901, Hohne described his case, which was of a tumor of the tube the size of a cherry; 1 cm. in lateral direction from the right tubal corner of the uterus, situated inside of the upper tubal wall between the outer fibers of the tubal circulatory muscle. A number of fibroids were present in the uterus.

Hohne found on microscopical examination, an extensive proliferation of the endothelium of the lymphatic vessels. This caused solid cell masses which produced a picture similar to that of endothelioma.

In 1905 Dienst followed with a case of lymphangioma of the ampulla of the tube, being about the size of a pea. He calls his tumor a myxofibrous capillary angioma, which name accurately describes the microscopical findings, there being also a multiplication of the endothelial layers and a complete filling of the cavities with solid cell masses and outgrowths. Again was there a myomatous condition present in the uterus.

In 1907, Kermauner found a tumor which he described most exactly. It was the size of a bean and situated in the upper wall of the right tube. The microscope revealed a well defined tumor, nevertheless proliferating into the neighboring tissue entirely unhindered and causing destruction of the same. The endothelial proliferation inside the capillaries was most extensive. Rarely could capillaries with a single endothelial layer be seen. The endothelial elements were greatly swollen and possessed a cuboidal shape with not distinctly or sharply defined outlines.

In some capillaries this proliferation was exactly and regularly stratified, filling the cavity or lumen with these cell masses. True bands and streets of endothelial elements were formed in this manner.

Kermauner further observes and states that we may judge by these pictures and by the proven malignant character of this tumor, that there is perhaps a transition stage between lymphangioma and endothelioma. The muscle bundles of the tube are scattered by the growth of the tumor and an incomplete boundary of round cells surrounds the outer border of the tumor. His tumor he further remarks, penetrates the folds of the tube. A large fibroid uterus is found in this case also.

R. Franz, in 1909, described his case, wherein the lymphangioma was the size of a cherry. The epithelial elements were swollen considerably and not sharply defined. Extensive proliferation of the endothelium was to be seen and at the periphery of the tumor were lymphocytic areas which very likely came from the newly formed lymphatic vessels. Instead of a simple myomatous condition alone being found in the uterus, he states that in addition an adenocarcinoma was found in the uterine body. The lymphangioma grew through the muscle layer of the tube and with the endothelial overgrowth it constituted an exact picture of anatomical malignancy.

Today, a Japanese investigator, recently published the descriptions of three cases of myoma where he examined the regional lymphatic vessels. In his first case, under the ovaries and inside the broad ligament, were several little ovoid bodies or tumors with fluctuating humps at the surface covered with normal peritoneum. On cutting through he found the tissue rather spongy, with cavities ranging in size from a pinhead to a pea, with a milky fluid inside each one. In connection with these tumors, he found at the innominate line of the pelvis, at both sides, sacs the size of eggs, symmetrically situated near the ovarian blood-vessels.

These sacs were connected by thin walled vessels, with a caliber smaller than a pencil and they continued above in this curious string-of-pearls arrangement to the hilus of the kidneys where they finally disappeared in the retroperitoneal fat. Inside these ducts was a cloudy fluid with many fat droplets floating in it.

Microscopical examination of these tubes showed moderate dilatation of the fine lymphatic vessels. The sacs under the ovaries were filled with many cavities lying close together of different size and shape, which contained granular contents. All the cavities were lined with flat endothelium. The nuclei protruded slightly into the cavities of the lymph-vessels and very rarely did the endothelium show cuboidal form, however, there were places where one saw many layers of cells. These he thinks to be oblique sections. In his description of the second case we find the condition almost the same. There are multiple myomata in the uterus, and the lymphangioma is the same size as the preceding. Histologically it is the same and in one of the iliacal glands, he finds a duct with a high columnar epithelium. His third case is an exact counterpart of the first case so further description is unnecessary.

In some dilated lymph-vessels could plainly be seen hypertrophy of some muscle fibers and elastic elements. The dilatation of lymphatic vessels was limited at the base of the plexus lymphaticus supraovarius. Todyo cannot decide whether there is a simple lymphangiectasis or a true lymphangioma present in this case, because it is impossible to say whether there occurred a new formation of lymph-vessels or only a dilatation of the ones present primarily. He means that the lymphangiectasis is caused perhaps by prevention of the flowing upward of the lymph and a subsequent stasis of the same. However, he adds, one must be prudent in this explanation, because closure of a lymphatic vessel may be caused by most varied conditions, and dilatation of lymph-vessels behind a closure point is seen most rarely. He further states that it is not likely that the myoma compresses the efferent lymphatic ducts, nor is it probable that in the three cases of myomata, the lymphangiectasis developed by a cause which cannot be proven by an anatomical examination. He thinks it impossible to decide whether primary lesions of lymph-vessels are the cause for the lymphangiectasis or not.

This resolves itself into a very important question—is there any relation between the lymphangiectasis and the myomata?

Fabricius of Vienna says that it is not at all impossible to find dilatation of the lymph-vessels between the broad ligament in conjunction with uterine myomata, and this statement is corroborated by Pozzi of Paris. Leopold has too described such a finding.

One must not forget that in heart diseases, common as myocardial degeneration which is observed frequently in cases of myomata, that it is not due to hemorrhages entirely that we find this condition, but that the myoma has an added etiologic value in that possibly metabolic and biochemical changes or autointoxications take place which exert their influence on the heart and vessels. It, too, may be an easy matter to understand now that not only do the blood-vessels suffer but the lymph-vessels may acquire lesions in them. While the myomata perhaps play such a rôle in the causation of lymphangiectasis, we may further theorize on the action they have in the etiology of lymphangioma in its true form, if it has any such effect at all. The fact that myomata have been present in the uterus in all these cases which have been reported, would lead one to think that they were of some special causative value.

Personally, I feel inclined to attribute to the myomata, the presence of the lymphangiomata in these cases. With the growth of the myoma possibly some biochemical substance is generated which stimulates the growth or overgrowth of the lymphatic vessels in the tube which may cause a temporary lymphangiectasis followed by the growth of the true lymphangioma, or perhaps there is no such stage and the lymphangioma is formed from the very first by this biochemical action.

Then again we cannot lose sight of the fact that there may be a slight mechanical agency concerned in the formation of the lymphangioma by direct pressure of the myoma on adjacent lymph-vessels. I realize that this point has been considered by several writers on this subject, and that they attach little importance to this possible factor, however, for want of a better explanation, I make mention of it.

Two sets of lymphatics are found in the uterus, superficial and deep. Those from the body and fundus pass outward into the broad ligament and are joined by the lymphatics from the broad ligaments and Fallopian tubes, then ascending with the ovarian vessels to the lumbar glands. Now, with the centrifugal growth of the myoma, an actual occlusion of the lymph-vessels may ensue with a squeezing out of the lymph into the lymph channels of the tube on the same side as the myoma is located. By this a dilatation of these channels takes place and by this distention, an irritation of the lymph spaces is caused with a later proliferation of new ones.

This explanation will probably not meet with general approval, however, in reviewing the pathological findings of these reported cases of lymphangioma, one is immediately struck with the idea that the myomata, being ever present, must serve to cause or help cause these tumors. Having seen no attempt to explain the lymphangioma's presence heretofore, I offer these two theories; the biochemical activity of the myoma and the mechanical agency, which may be present either singly or combined.

A REPORT ON A CASE OF OSTEOMALACIA, WITH A REVIEW OF THE AMERICAN CASES.*

BY

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(With one illustration.)

OSTEOMALACIA is such a rare disease and its etiology so shrouded in mystery that it is the duty of those who by chance meet such a condition to report the same with as much detail as the patience of the reader will permit, with the hope that in the future some lucid thinker and investigator may, from the mass of facts and theories, distill a drop of truth which will crystallize into a knowledge of the cause and treatment of osteomalacia.

The patient was brought to the hospital in an ambulance and admitted in September, 1911. She was born in Sicily, thirty-nine years of age, and had resided in New York for ten years; height 4 feet, 5 1/2 inches; para x, oldest child eighteen years of age, youngest child four years and living; two other children living, aged eight and six; five children died from various diseases. All previous labors were easy and no instruments used.

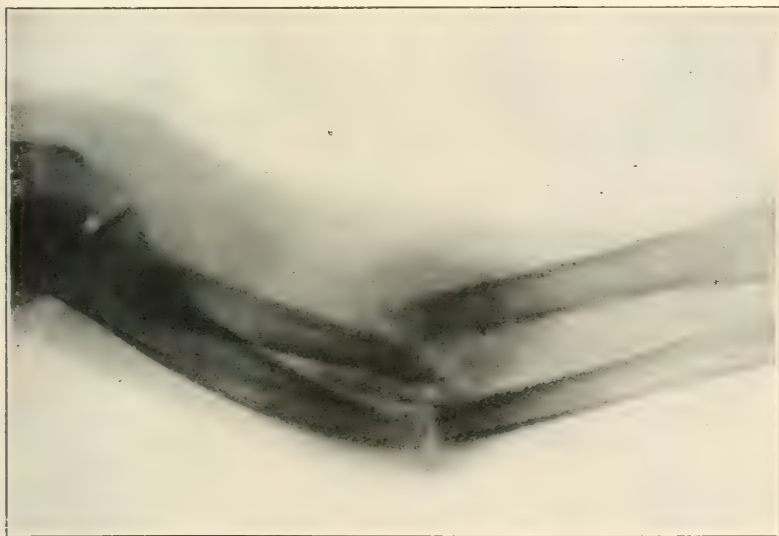
Upon admission to the hospital patient was pregnant at term, having been in labor for twenty-four hours. Cervix fully dilated, membranes ruptured, fetal heart about 120 and regular, pains were frequent, but with no advance of the head which presented, child in L. O. A. position.

On examination the pelvis was found flattened by a marked projection forward of the sacrum, the internal conjugate was made out to be about 10 cm. and the true conjugate estimated at 8 cm. The pubic arch was very much narrowed, the rami being almost parallel. The child's head was felt to be very soft, though of normal size with moderate molding. Being unable at this time to obtain any further history than already mentioned and not suspecting osteomalacia, we were at a loss to explain how a woman with such a pelvis could have had nine easy labors without instruments but finally concluded that prob-

* Read at a meeting of the Society of the Alumni of the Sloane Maternity Hospital, January 26, 1912. This case is reported by courtesy of Dr. G. L. Brodhead, from the service of Gouverneur Hospital, New York City.

ably the marked softening of the child's head permitted excessive molding and spontaneous birth. At this time I thought also of other cases of deformed pelves, in which a Cesarean section had been strongly advised, but which when left alone delivered themselves spontaneously.

As the membranes were ruptured, the cervix fully dilated and the head molded, forceps were applied in the high position and traction used for a few moments, but the head did not seem to advance. At this time we considered the advisability of performing Cesarean section but as the membranes had been



Skiagraph of left forearm, from a case of osteomalacia, produced by patient elevating herself on the arm in bed. The thin cortex present in both bones is also shown.

ruptured some time and as the fetal heart was now irregular, I did not consider it the part of wisdom to subject the mother to the risk of an abdominal operation under these conditions, to save the child, which even now was not in good condition. Estimating that only a slight increase in the pelvic diameters was needed for delivery, pubiotomy was considered; but before attempting this and because the child's condition was becoming worse, forceps were again applied, and as some advance was made with each traction, the instruments were continued and after fifteen minutes of intermittent traction, the child was born; and though the fetal heart continued to beat for several

minutes, the child never breathed. Upon completion of the patient's history, when we made our diagnosis of osteomalacia, I was very glad that we did not perform pubiotomy.

In the middle of the patient's left forearm was a deformity consisting of a bony mass slightly larger than the forearm and an angulation of thirty degrees from normal. At the site of this deformity, there was a moderate amount of free motion—five to ten degrees. Upon the patient's admission, this was thought to have been the result of an old fracture, but upon getting her history later on, we learned that this had come on gradually for the last year, because of the fact that the patient had spent most of this time in bed, and the deformity was due to rising on the arms while in bed.

Previous History.—One year ago the patient began to have irregular pains in the hips and along the legs, and at the same time complained of feeling weak. This pain and weakness continuing over a period of six months she finally had to go to bed and remained there for six months before entering the hospital. The patient's living children are all healthy and well nourished as is also her husband, and they all live together.

On examination the patient appeared thin, but not emaciated; there was moderate anemia and her spirits were good. She complained of severe pain in both hips, especially the left, upon exertion, even upon being lifted and turned in bed, with great sensitiveness to pressure. This pain was so severe that it was impossible (without an anesthetic) to turn the patient on her side to take pelvic measurements. The left trochanter major was displaced inward and upward, and flexion at the hip-joint was possible only for about eighty degrees; the right hip-joint could be flexed to about ninety-five degrees. There was marked lordosis of spine in lumbar region and the crests of the ilia yielded to pressure.

Pelvic Measurements.—Interspinous diameter, 26 cm., intercrisal, 29 cm., right oblique, 20 cm., left oblique, 21 cm., external conjugate, 19.5 cm.

Examination of the urine showed the following features: amber, cloudy, specific gravity, 1025, albumin, 0.1 per cent., by Esbach, diacetic acid present, but no casts.

A blood count showed 4,450,000 red cells, 16,000 white cells, 70 per cent. hemoglobin, with a differential count of 82 per cent. polynuclears and 18 per cent. mononuclear cells. No malarial plasmodia found.

An x-ray examination was made at the Gouverneur Hospital.

Osteomalacia is a comparatively rare disease and since the collection of cases reported by Dock in 1895, I have gathered the following from American medical literature.

CASE I.—1895. C. G. Cummiston (*Annals Gyn. and Ped.*, vol. viii) reports a case of osteomalacia in a woman born in Geneva, age thirty-nine, para vii, in whom the condition started eight years previously with pains in both legs, rendering walking difficult. At this time she was treated for chronic rheumatism and the condition became worse with each succeeding pregnancy (v-vii inclusive) though there was some improvement after each labor. Finally the patient was compelled to be in bed all the time, having intense pain in legs, pelvis and kidney region, with violent muscular contractions of legs during sleep only.

Physical Examination.—Abdomen prominent because of lumbar kyphosis; pelvis and thorax approximated, slight flexion at knees, some inward rotation of thigh and projecting beak at pubis.

Measurements.—Interspinous, 18 $\frac{3}{4}$ cm., intercrystal 26 cm., ext. conjugate, 16 $\frac{3}{4}$ cm., true conjugate 7 cm. Ascending rami of pubis parallel, tuber ischii separated two finger-breadths, coccyx displaced forward. Movements at hip-joint: flexion at ninety degrees, pain great; abduction very limited, outward rotation ten to fifteen degrees. Shoulder rotation limited, elbows and hands normal. Height 141 $\frac{1}{2}$ cm. (4 feet 8 $\frac{1}{2}$ inches).

Treatment.—Castration with considerable improvement. Ovaries normal except few small cysts.

CASE II.—1903. Montgomery (*J. A. M. A.*, vol. xli) reports a case of osteomalacia, but the history is so meager and the dementia and paralysis such a prominent factor that we must be doubtful of the correctness of the diagnosis.

CASE III.—1904. T. A. Davis (*Annals of Surg.*, vol. xl) reports the first case of osteomalacia in the male in North America; a Norwegian, age thirty-three, in the United States twenty-five years, married thirteen years; three healthy children. Had been treated for rheumatism of feet and ankles; then fractured humerus from slight fall which fracture refused to unite. A diagnosis of sarcoma made and amputation of the shoulder-joint performed. The blood showed white blood cells, 6800; red cells, 3,704,000. The urine was normal. Pathological examination after amputation showed osteomalacia, and patient was much improved after operation.

CASE IV.—1904. Malsbury (*International Clinics*, vol. 14, S. ii) reports a case of osteomalacia in an unmarried girl about twenty-three years old, never pregnant, whose symptoms began at about sixteen years, with pains in the lower extremities and pelvis and difficult locomotion, sensitiveness to pressure. Presence of rachitic rosary and bow legs marked, myasthenia. The

urine was normal. Radiographs showed shortening neck of femur on either side. X-rays pass through bone as if soft tissue. The pelvic measurements were as follows: Interspinous diameter, 22.5 cm., intercrystal 23.5 cm., external conjugate 17.75, diagonal conjugate 6 cm.

Treatment.—Panhysterectomy, improved.

CASE V.—1905. McPherson (*Bull. Lying-in Hospital* vol. ii, No. 1) reports the only case of osteomalacia occurring in the service of the New York Lying-In Hospital, up to that date in over 40,000 cases.

Para x, age forty-two, Austrian, and in the United States eighteen years, married twenty-two years. First noticed that spine became crooked, then pains in the back, thorax, groins and legs and unable to walk without assistance. Height 134 1/2 cm. Weight 49 kilos. Pelvic measurements: I. C., 21 1/2 cm., I. S. 22 1/2 cm., R. O. 21 1/2 cm., ext. conj. 19 1/2 cm., L. O. 22 cm., diag. conj., 10 cm., true conj. 8 cm. Rami of pubis approximate each other. Urine and blood examinations negative.

Treatment.—Cesarean section by Dr. Markoe; separation of abdominal wound twelve hours later and intestines protruding; resuture; infection of abdominal wound and of uterine cavity; discharged improved on 35th day.

Child died two days after delivery with icterus neonatorum. Autopsy showed atelectasis, general congestion, hyperplasia of spleen.

CASE VI.—1906. Oskar Klotz (*Montreal Med. Jour.*, vol. xxxv) reports two cases of osteomalacia associated with lipemia, one in the female, one in the male.

a. Female about twenty-four years old, no history of pregnancy or marriage, was operated upon for cystic mass in broad ligament of right side and died after operation. Autopsy: dwarfed girl with bending of left femur and posterior bending of both tibia; bones cut easily and could be pared with a knife, a marked osteomalacic pelvis, the tuber ischii being separated but 2 3/4 cm., the long bones showed only a shell with honeycombed structure within, containing soft and pulpy marrow. Kidneys showed chronic parenchymatous nephritis. Blood-vessels of lung, liver, kidney, spleen and heart muscle showed fat lipemia.

b. Male, age twenty-four, born in England, in Canada one year. Tibia curved backward; tuberosity right humerus fractured at surgical neck; left humerus broken at surgical neck; all bones soft, easily broken. Autopsy: osteomalacia extending throughout entire osseous system

CASE VII.—1906. McCrudden, Francis H., of Boston reports case in female about eighteen and never pregnant or married. Castration performed, followed by improvement but in one and a half years condition returned and grew worse.

CASE VIII.—Stephen Brown (*Charlotte Med. Jr.*, vol. lx) reports a case of osteomalacia in a female, age forty-five, married at fifteen years of age and sterile, menopause at forty-four years.

At thirty years of age rheumatic pains began in hips, followed by pains in bones of left leg, and six months later, broke ankle walking across floor. Two years later broke thigh by some trivial injury; some years later broke left arm. Pelvis flat. This history is very incomplete but it is probably one of a mild case of osteomalacia.

SUMMARY OF CASES REPORTED IN AMERICA SINCE 1895.

FEMALE, SEVEN CASES.

Para	Age	Nationality	Time in U. S.
xi	42	Austrian	Eighteen years
vii	39	Swiss	Not stated.
o	23	United States	Life.
o	24	Canadian	Life, in Canada.
o	18	United States	Life.
o	45	United States	Life.
x	39	Sicilian	Ten years.

MALE, TWO CASES.

Age.	Nationality.	Time in U. S.
24	English	Canada, one year.
33	Norwegian	Twenty-five years.

Of these cases reported since 1895, one-half were under twenty-five years of age; one-half were born in the United States or Canada; two were males, and of the seven females, four had never been pregnant.

Dock's report included ten cases up to 1895, all of American birth, all females, five single and no children. Four had large families (5 to 10 children), but the disease in question began after menopause. One puerperal case at thirty-five years after birth of fourth child. Dock's own case: Born in the U. S., age twenty-four, ii-para.

Up to the present time, therefore, there have been reported (including our own case) on this continent a total of twenty cases of which only two were male. Of the eighteen female cases, nine or 50 per cent. had never been pregnant; eight or 44 per cent. had four to eleven children, and one had two children.

The number of patients suffering from osteomalacia is probably larger than our figures would indicate because some cases are not reported. J. Whitridge Williams mentions the fact that Hirst has seen three cases in Philadelphia, and that he himself has seen an equal number. Besides the cases not reported, there is probably a considerable number of mild cases that are not recognized, and are treated as chronic rheumatism; and which either improve spontaneously or die of some intercurrent affection or progress to the later stages, when they are generally recognized. In most of the published cases, a previous diagnosis of rheumatism had been made.

Osteomalacia may be defined as a chronic disease of the bones of adults, characterized by pain and associated with progressive muscular weakness, causing a diminution in the amount of inorganic substance of bone and an increase in the organic proportion, leading first to fractures from slight causes and later to increasing softness and bending and deformity of the bones, and ending, as the disease progresses, in complete helplessness and death from exhaustion.

What the underlying cause or causes of this condition may be, it is difficult to determine: poor hygienic conditions, damp dwellings and improper food seem to be accepted as sufficient causes for the disease. But not all the reported cases suffered from insufficient nourishment; and in our own case, all the patient's family live together and the rest are healthy and strong, and she informed me that she desired to leave the hospital and to return home so that she might have something good to eat!

Multiparity is generally considered the principal factor in the disease and the reports from Europe, especially Italy, Austria, Switzerland, and the Rhine Valley would seem to prove it, but of the cases reported on this continent in females, more than one-half had never been pregnant and again, the disease is occasionally found in men. Disease of the thyroid and suprarenal glands have been brought forward as a causative factor, but it remains for the future to prove the contention.

The theory of halisteresis, *i.e.*, that an acid thought to be lactic acid, circulating in the blood, dissolves the lime salts of the bone, has had wide acceptance and this belief is due probably to faulty technic in finding lactic acid in the urine of cases of osteomalacia.

The investigations of competent men, however, seem to show that the blood and tissue fluids do not become acid and that lactic acid fed to animals gives negative results. At the present time, the theory of halisteresis has been abandoned.

Another theory of the etiology is that of bacterial infection, but this has few supporters to-day.

Fehling's idea that osteomalacia is a trophoneurosis and dependent upon the internal secretion of the ovary, has had wide acceptance and to-day is recognized in most text-books, whose authors recommend castration of the patient to cure the disease. McCrudden of Boston, who has done the most in this country in the study of bone metabolism, especially in reference to osteomalacia, takes issue with Fehling's theory and shows that castra-

tion has no effect on the metabolism of normal individuals and reports that his own case, while improved for a short time after castration, relapsed in a year and a half and became worse, and that of Fehling's fourteen cases, but six were well three years after operation and two showed temporary improvement and then became worse and the others either died or were lost track of.

The reports of other observers show that a large percentage of patients were not cured by castration and as many of the cases reported as cured by operation were not followed for any length of time, it is very probable that the percentage of cures is less than the figures indicate. Thus far, at least, the histological examinations show no constant changes in the ovaries removed from patients with osteomalacia.

The present idea that osteomalacia is due to disturbances in the metabolism of bone is gaining ground; this theory is based upon the fact that bone like other body tissues undergoes destruction and repair (catabolism and anabolism) and that in normal bone these two processes are equal; whereas, if there is a sudden increased demand for lime salts, be this due to the growing fetus, or to calcification in various tissues, or concretions in the kidneys, the bones undergo increased catabolism and osteomalacia results. This may also ensue from insufficient supply of lime salts in the food to take the place of that used up in normal catabolism.

For details of bone analysis and metabolism experiments in this relation, I would refer to the excellent monograph of McCruden entitled, "Studies in Bone Metabolism" in the Archives of Internal Medicine, June 1910.

The pathology of osteomalacia seems to show that the process consists in laying down new calcium-free bone for normal bone that has undergone catabolism.

The symptoms of osteomalacia in the beginning at least are often vague and consist of rheumatic-like pains, generally in the hips, spine and lower extremities; associated with these pains there appears muscular weakness and frequently ileo-psoas paralysis with abduction of the thigh. The pains are increased by pressure and by movement, so that walking becomes difficult and soon the patient spends most of the time in bed. Soon after the appearance of the disease there is a marked reduction in the patient's height, fractures occur from slight injuries and bending and distortion of the bones ensue (which may be very marked) especially of the spine, pelvis and lower extremities. The prominent beak-like pubis, the projection forward, often

extreme, of the promontory of the sacrum, and the parallel descending rami of the pubes, the easily compressible (rubber) pelvis with the attendant pain, make the osteomalacic pelvic picture distinct. The mind remains clear, the knee-jerks are frequently increased, the urinary or blood changes are negative, or at least not constant, there are no visceral changes and the temperature as a rule remains normal.

The symptoms grow worse during pregnancy and may improve considerably for a period after labor, but recur if the patient becomes pregnant again, or the symptoms may grow progressively worse without pregnancy; in general, it may be said that the natural tendency of this disease is to produce death from exhaustion.

The treatment of osteomalacia at the present time is unsatisfactory, though there have been reported cures following simple chloroform narcosis and the administration of chloral and of adrenalin and of thyroid, and with no special treatment. But in most of these cases, the improvement lasted only a few weeks or months.

More permanent results have followed hygienic treatment in conjunction with the administration of phosphorus and it is accepted that pregnancy or lactation should not be countenanced. While startling improvement in some cases has followed castration, there have been many failures and we should not place too much reliance upon the operation. Nevertheless, other methods failing, we are justified in performing a laparotomy with this end in view.

The delivery of a living child from a patient with osteomalacia is possible, either spontaneously or with forceps; by inducing premature labor, or by Cesarean section, depending upon the amount of pelvic deformity. However, in this, as in other pelvic deformities, one must not rashly rush into performing that simple, expeditious, though sometimes abused operation of Cesarean section.

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59 WEST FIFTY-FOURTH STREET.

CORNUAL PREGNANCY IN THE NORMAL UTERUS WITH THE REPORT OF A CASE.*

BY

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(With one illustration.)

THE term cornual pregnancy, while in general somewhat loosely used, is here meant to define the condition resulting when the impregnated ovum becomes imbedded in some part of the cornua of the normal uterus. The attachment may be entirely upon the cornual endometrium, or as is more common, the decidua may extend partially into the endosalpinx, producing a partial interstitial or tubo-uterine pregnancy, with fetal development forcing the products of conception into the uterine cavity.

The condition is extremely rare, not being mentioned in a large number of obstetric text-books and occurring but rarely in the literature. Sanger and von Herff (*Encyclop. der Geburtshilfe und Gynecologie*, vol. ii) state that some sixteen cases are known to have been reported. Anatomically, in a true cornual pregnancy, there is present a uterus irregularly enlarged, the involved cornua being usually markedly distended, while the entire uterus is large and boggy.

In most cases there is a distinct diaphragm of tissue separating the fetal sac from the general uterine cavity, the membrane being apparently formed by the endometrium and a portion of the muscular ring composing the cornua. This latter may present the appearance of a distinct os, rather resistant to dilatation and through which the fetal membranes may be plainly felt.

* Read before the Obstetrical Society of Philadelphia, January 4, 1912.

J. C. Webster (*Ectopic Pregnancy*, p. 76) in discussing interstitial pregnancy mentions the possibility of the ovum extending into the uterus and thus developing partly in the tube and partly within the uterine cavity. In other cases Webster has seen communication between the uterus and the fetal sac closed by a wall formed by the decidua, and in still another group the communication may remain patent and be only closed off by the fetal membranes themselves.



FIG. 1.—Diagrammatic view of cornual pregnancy in the normal uterus. Note the endometrial septum separating the fetal sac from the general uterine cavity and the extension of the placenta through the uterine cornua and into the lumen of the tube.

The terminations of cornual pregnancy are, rupture of the abnormally distended uterine horn, with all the attendant phenomena of the ordinary ruptured ectopic pregnancy, with additional gravity of the symptoms due to the extensive blood supply of the uterus; or there abortion may occur through the uterine canal; or the pregnancy may go on to term, development continuing in the uterine cavity proper, with birth in the usual manner. In this connection Webster (*q.v.*) reports a case of interstitial pregnancy, wherein the patient expelled a complete uterine decidua to which was attached at one of the upper angles, an early ovum which had evidently been situated in the interstitial portion of one of the tubes. Wagner (*Die Extra-uterine Schwangerschaft*, p. 19) describes a case in which a woman of thirty-three years who had normally borne three

children, gave the menstrual history of a three months extra-uterine pregnancy. On examination she presented a parametrial exudate on the right side and a soft, sausage-shaped tumor, continuous with the uterus on the left. The patient later aborted a three months fetus imbedded in its membranes, the whole making a cast of the uterine cornua and the interstitial portion of the tube. Wagner considers this case one of implantation of the ovum in the uterine horn and extending into the tube.

The third termination of this form of pregnancy, intrauterine development of the ovum, with delivery per os uteri, is extremely rare, but must be considered as a possibility.

The etiology of the condition is that of ectopic pregnancy in general and is of no especial significance save that there may possibly exist some very rudimentary hyperdevelopment of one or both uterine cornua with the formation of a recess or sac wherein the ovum may be delayed in its course to the uterine cavity and where, having become impregnated, it may remain and imbed itself.

The diagnosis of cornual pregnancy is of the utmost importance and presents many difficulties. There may be present the usual signs of intrauterine pregnancy, complete amenorrhea, gastric disturbance, blueness of the vaginal mucosa, secretion in the breasts, and enlargement of the uterus. The menstrual history is often particularly misleading. There may be present the variable pathological menstruation characteristic of ectopic pregnancy or, as has been said, there may be absolute suppression. The suppression is due to the fact that a portion at least of the decidua occupies the cavity of the uterus and the menstrual reaction is therefore abrogated.

Pain is a very constant symptom. The steady distention of the cornual portion of the uterus, with the corresponding irregularities of circulation and congestive changes in the remainder of the organ, give rise to a steady dull ache on the affected side. Added to this are the occasional attacks of sudden lanceolating pain, which occur when the congestion becomes acute or when the blood pressure rises for any reason.

Should rupture take place the symptoms of serious intra-abdominal hemorrhage will at once supervene.

Upon examining a case of cornual pregnancy the usual physical signs of pregnancy may readily be elicited; the uterus, however, is not sufficiently enlarged to correspond with the

duration of the pregnancy; the enlargement is irregular, extending around the uterine horn and merging completely with the general contour of the organ. There is never a pedicle or any area of differentiation between the enlarged horn and the uterus proper. The enlarged area may present a sense of great tension and very firm distention, and the tube and ovary may be of normal contour.

Upon inspection of a cornual pregnancy *in situ*, after laparotomy, the impression of overstretching may be startling. Dr. B. C. Hirst has informed the writer that in a case seen by him the uterine cornua was of such thinness that the fetus and membranes could be plainly seen enclosed within the thinned out myometrium.

In the case here reported the condition was not seen, but to vaginal touch an impression of marked thinning and distention was clearly conveyed. In the diagnosis of cornual pregnancy, the following mistakes are commonly made according to Kustner (*Ectop Schwangersch.*, p. 118).

On the one hand they are thought to be cases of normal pregnancy, with marked hypertrophy of the cervix, the true uterine cavity being mistaken for the cervical canal and on the other hand they have been considered as incomplete abortions, the muscular diaphragm next to the uterine cavity being mistaken for an extremely well marked retraction ring.

The treatment of cornual pregnancy is essentially individual and depends upon careful continued study of each case with regard to the probable termination. Inasmuch as some of the cases seem to go to term, and the patients are at that time delivered of normal infants whose later development, at least, has been entirely intrauterine, expectant treatment would naturally be indicated.

Upon the other hand the possibility of rupture through the uterine horn is ever present and brings with it such a serious chain of sequelæ that in the opinion of the writer, radical termination of the pregnancy is the course to be pursued. Exceptions may be made in cases where the birth of a living child is of great family or medico-legal importance, but even here both parents should be informed of the gravity of the situation and the patient should be in constant residence in a hospital where operation may be undertaken immediately, should rupture occur.

The proper operative procedure is to have patient and assistants prepared for abdominal section and then to attempt the

emptying of the uterine cornua by the vagina. Should this fail, section should be performed, the cornua opened, the fetus and membranes delivered, the uterine portion of the tube explored and emptied if necessary and the uterine wound closed. It is important that, from the standpoint of diagnosis and prognosis, cornual pregnancy should be regarded as a variety of extrauterine gestation, while from the surgical side it should be treated not as an ectopic but as an intrauterine pregnancy, requiring Cesarean section for its relief.

In attempting delivery per vaginam, the examining finger will frequently discover a distinct septum of variable density, separating the fetal sac from the general uterine cavity. There will usually be noted a palpable os or opening into the pregnant cornua, which opening may be dilated and the placental forceps being introduced, the fetus and placenta may readily be delivered.

Vaginal termination of cornual pregnancy has been described in detail by Wagner (*q.v.*), who has seen several cases of his own and quotes Walcher as advocating the same procedure.

The case which came under the observation of the writer was in detail as follows:

The patient was a lady of thirty-four years, the wife of a physician. Her previous history was uneventful, menses regular and normal, no illness of note. She had previously borne two healthy children, the first labor a slow instrumental one, the second easy and spontaneous. She had had two early miscarriages in the first years of her married life. In February, 1911, she noticed some delay and irregularity in the menses. This condition persisted until May, when there developed absolute amenorrhea with the subjective symptoms of pregnancy. The patient then began to complain of a steady dull pain in the right iliac fossa, which was at times aggravated by severe lanceolating attacks of great violence. On at least two occasions there was a slight bloody discharge, simulating a scant menstruation.

When examined by the writer, the patient presented the usual signs of pregnancy, blueness of the vaginal mucous membrane, engorgement of the breasts, nausea, etc. Upon vaginal examination the uterus was found irregularly enlarged to the size of a grapefruit. The main enlargement was on the right side of the fundus uteri, a large, fairly dense mass, of smooth contour and apparently continuous with the body of the uterus which was itself hypertrophied and boggy in consistency. A tentative diagnosis of some form of ectopic pregnancy was made and the patient referred to Dr. B. C. Hirst for his counsel. Dr. Hirst considered the case one of cornual pregnancy and advised expectant treatment in the hope that the gestation

might be converted into an intrauterine one and go normally to term. Treatment by rest and careful avoidance of exertion was accordingly instituted, but after a trial of three weeks, the pain and discomfort became so marked that the patient demanded relief and operation was determined upon.

On June 24, after a thorough preparation for abdominal section, the cervical canal was dilated, under ether anesthesia, and the uterus digitally explored. The organ was enlarged and flaccid with a large, dense mass occupying the right cornual region and bulging into the cavum uteri. A distinct septum of thick, soft but resistant tissue separated the cornual mass from the general uterine cavity. This septum presented a small central opening which was readily dilatable with the finger, giving admittance to the fetal sac. There was found a normal four months fetus with its membranes and placenta intact the entire ovum lying within the thinned-out uterine horn and extending into the uterine extremity of the tube. The myometrium was thinned out to a barely palpable tissue, and gave a tactile impression of marked attenuation. By means of a placental forceps the fetus and placenta were easily removed. The latter organ presented a characteristic appearance, being much flattened and having at one side a long, finger-like prolongation which had extended through the uterine cornua and had been attached for a considerable distance along the lateral aspect of the tube. There was noted a general development of decidual tissue throughout the entire uterine cavity, which was curetted.

The patient made an uneventful recovery and was discharged from the hospital in two weeks.

To summarize the salient features of this case,—cornual pregnancy may be spontaneously converted into the usual intrauterine form and go normally to term, or the sac may rupture with very profuse hemorrhage from the uterine muscle.

The diagnosis is somewhat difficult but can usually be determined by repeated pelvic examinations.

In outlining a course of treatment, the patient should be under the closest observation, in order that, should rupture occur, operation may be immediately performed.

If surgical intervention is decided upon before rupture occurs, the pregnancy should first be approached by the vaginal route, and the abdomen opened only if delivery per vaginam be found impossible.

If abdominal section be required, a cornual pregnancy should be regarded as an indication for conservative section of the sac with delivery of its contents rather than for excision of the parts involved as in ectopic pregnancy.

NORMAL HUMAN BLOOD SERUM IN OBSTETRIC AND
PEDIATRIC PRACTICE.*

BY

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APPROXIMATELY eighteen years of trial to which the serum of the horse, immunized artificially against the toxin of diphtheria, has been subjected, has put it in the rank of a specific in the treatment of diphtheria. The principle of artificial immunization operative in connection with this serum has been adopted in other instances so that now we have other antitoxic sera, more or less efficient, developed against several organisms. In the meantime, during the growth of knowledge concerning the curative properties of the serum of animals artificially immunized, it has been learned that normal sera possess under certain circumstances a decided therapeutic value.

Those experienced in the use of the various sera are well aware that their advantages are not unalloyed. Associated with the brilliant successes attending their use are numerous tragedies, begotten of their untoward effects. These effects are very commonly encountered when the serum of an animal is used in a different species but fortunately are rarely severe enough to produce death, and they do not occur when the serum of the same species is used. This latter observation I made in 1902, in using normal human blood serum after having had a disagreeable experience with the use of diphtheria antitoxin.

A young man, twenty years of age, ill with pulmonary tuberculosis, was admitted to the New York City Hospital. After a fair trial of the then recognized methods of treatment, I suggested to the attending physician that we withdraw a quantity of blood from some person convalescing from a surgical condition, which had not in any way affected the quality of the blood, allow it to clot and with the separated serum inject our tuberculous patient, having in mind the possibility of furnishing some disease resisting substance which had prevented the donor from contracting tuberculosis. The proposition seemed imprac-

* Read at a meeting of the Society of the Alumni of the Sloane Maternity Hospital, January 26, 1912.

ticable at the time and a substitution was made. It was decided to use normal horse serum instead. This also was not procurable but a substitute was furnished by Dr. William H. Park, in the form of a low grade diphtheria antitoxin, having a strength of 150 units. It was reasoned at the time that the antitoxic properties of the serum, which was elaborated specifically against the diphtheria toxin, would also neutralize the toxins of other infectious diseases, a view then quite commonly held.

Following directions I began subcutaneous injections of the weak antitoxin. Ten cubic centimeters were given three times per day. At the end of twenty-four hours there was a notable change in our patient, but not for the better. He complained of severe headache and excruciating pains in the joints, especially in the knees. The temperature which had been quite constantly about 102, rose to above 104, the respirations increased and there appeared over the entire body, the worst itching, burning, urticarial rash I have ever seen. A few more injections were given and with each the symptoms grew worse, making it necessary at the end of the second day to discontinue the treatment. The injections made our patient worse than he had been, in fact he never regained the loss induced by the antitoxic serum injections.

Shortly after this experience I succeeded in getting from some of my patients a small amount of normal human blood serum and made subcutaneous injections in pneumonia, typhoid fever, erysipelas and diabetes. The disagreeable experience I had had with the diphtheria antitoxin injections made me over-cautious, so that I used of the normal human serum at each dose from 1 to 3 c.c. I made no distinction between the alien and homologous serum. My experience with the low grade antitoxin made me fear untoward symptoms from the human serum, therefore the very small doses were used. Boldness begotten of uniform absence of symptoms following single and repeated injections of small doses of normal human blood serum has led to an increase in the size of the dose. From time to time the amount has been increased until I am now ready to state that normal human serum in doses of 300 c.c., administered subcutaneously, or repeated in smaller amounts over a period of nine months, to the amount of 3500 c.c. will not cause any of the symptoms so often produced by single or repeated injections of a foreign serum.

Since the beginning of the use of antitoxin the untoward symptoms have been occasionally fatal and are so frequently met with that they have instilled a fear into many of the profession and the laity. These symptoms appearing after single or repeated injections of alien serum are now known respectively as "serum sickness" and "anaphylaxis." The literature descriptive of the research on this subject is so voluminous as to render a review impossible. Probably every research laboratory in existence has in the past or is at present directing efforts toward discovering the nature of the sensitizing body or is endeavoring to discover some substance which will neutralize the sensitizing body. In a recent volume of "*Ergebnisse der Allgemeinen Pathologie*" which reviews this literature to 1910, 422 contributions are referred to which deal with this subject.

From this study of anaphylaxis have come some very important observations. Those perhaps of most importance and which should be very seriously considered when the giving of alien serum is proposed as a therapeutic agent, are three in number.

Biedl, Kraus, Arthus and others have demonstrated that a marked fall in blood pressure accompanies anaphylactic shock. These authors have also demonstrated that the coagulation time of the blood is considerably lengthened in this condition. The third, and most important change brought about, is a decrease in the quantity of complement in the blood, which has been proven by Michaelis, Fleischmann, Friedmann, Friedeburger, Hartoch, Scott and others.

Nutritional experiments, dealing with injections of alien serum into guinea pigs, have proven that it causes either a retardation of growth or the death of these animals. Reviewing, then, in a few words, the effect of subcutaneous injections of alien serum, we have the following:

First.—Serum sickness with its fever, disturbing urticaria, joint pains, dyspnea, albuminuria, hematuria, and occasionally sudden death.

Second.—It reduces blood pressure.

Third.—It decreases the coagulability of the blood.

Fourth.—It causes a reduction in the amount of complement.

Fifth.—It interferes with nutrition.

Subcutaneous injections of homologous serum do not produce the above conditions. In my own experience with the use of

normal human serum I have never met with any untoward effects.

For the sake of comparing the nutritional effect of homologous with alien serum, an experimental study with normal human blood serum was made. The subject of the trial was a premature infant, born at about the eighth month of gestation. It took nourishment by mouth badly and steadily declined in weight from 2025 grams, the weight at birth, August 17, to 1625 grams, September 5, a loss of 400 grams in nineteen days. On September 5, injections of normal human serum were begun and were continued through twenty-one days, to September 26. The baby's food remaining the same as previously, the weight began immediately to increase, and suffering slight fluctuations, gained steadily for fifteen days to 2200 grams, a gain of 575 grams. It then receded during the next six days to 2125 grams, which was 100 grams more than the weight at birth. During this period the child received daily, subcutaneous injections of normal human serum, in amounts varying from 20 to 78 c.c., receiving a total of 896 c.c. in twenty-one days. At this time the child was taken away in good condition and able to nurse well.

Of other conditions in which I have had experience in the use of normal human blood serum, the various bleeding conditions rank first and of these, more especially the hemorrhages of the new-born. Experience to date which I have had with thirty-two of these cases now warrants a few conclusions.

The infrequency of this disease and the rapidity with which it proves fatal make it extremely desirable that we have a well-known specific, easily obtainable, with which to combat it. The beginning of this condition is not always in the same way. The baby may be in every way apparently healthy, plump, rosy and functioning normally. Without warning it may vomit a quantity of fresh blood or pass bloody or tarry stools and these may be the only manifestations of hemorrhage. The bleeding may be subcutaneous, of a petechial nature, or occur as hematmata. The umbilical stump, a divided prepuce or the gums may be the sites of hemorrhage. Fatal internal hemorrhages not infrequently occur without external manifestation and may affect the brain or any of the thoracic or abdominal organs. These cases clinically may show icterus, or may simply grow pale, feeble and die without apparent adequate cause. The autopsy makes the diagnosis and we find

the hemorrhages usually within the serous cavities or beneath a serous membrane, such as the pulmonary pleura, in the pericardium, under the capsule, of the liver, under the kidney capsule or in the peritoneal cavity. Microscopic examination of the various organs taken at autopsy shows anemia and cloudy swelling of the epithelium of the parenchymatous organs. The epithelium of the gastrointestinal tract usually shows the most advanced changes of degeneration and desquamation.

Drawing a conclusion from experience with thirty-two cases of hemorrhagic conditions, treated by normal human blood serum, I am convinced that this agent is a specific for this pathological condition. For a partial detailed report on thirteen of these cases I refer you to the June, 1910, issue of the *American Journal of the Medical Sciences*. Time does not permit a review of the cases not reported but I will review briefly a few of them; others would be but a repetition.

B. Z., male child, delivered at 9 P. M., October 19. At 9 P. M. Oct. 20, vomited blood; at 11 and 12 P. M. bloody passages. October 21, bloody passages at 3 A. M. and 4 P. M., October 22, bloody passages at 4 P. M. October 23, bloody passages at 11 A. M. and 4 P. M. October 24, three passages free from blood. Normal human blood serum was injected as follows:

Oct. 21, 24 hours after bleeding began	112 c.c.
Oct. 22	54 c.c.
Oct. 23	19 c.c.
Oct. 24	12 c.c.
Oct. 25	10 c.c.

When born this child did not have the plump, rounded contour of a normal baby but appeared poorly nourished. The stools were, from the beginning, very foul-smelling. The first temperature, taken twenty-four hours after birth, was $100\frac{4}{5}^{\circ}$. On the next day it rose to 103 and fluctuated between 100 and 103 for a few days when it returned to normal. When the serum injections were begun the child was too weak to nurse and cried but feebly. Within twenty-four hours after the first injection he was able to nurse his mother, cry more vigorously and made a steady gain to a normal condition.

N. J. L., born June 10, second child, negative family history; first child still-born on account of difficult labor. Present labor lasted two and one-half hours, breech presentation, no interference, no anesthesia, weight at birth 5 pounds 12 ounces. Child appeared normal, cried lustily, no cyanosis. On the third day slightly jaundiced. At this time it was noted he had a peculiar cry, there were spasmodic muscular movements and he stopped nursing. There was no vomiting, stools became yellow

and were normal. Physical examination showed a small child with skin wrinkled, cyanotic and dusky. He was aroused with difficulty, occasionally giving a loud, shrill cry when disturbed. The fontanelles were noticed to be tense and bulging. The pupils were slightly unequal and the eyes were turned to one side at intervals. There was rigidity of the neck and extremities at intervals. There was twitching of the muscles of the face, arms and legs. The knee-jerks were exaggerated. He would not take the breast but would occasionally swallow fluid administered with a dropper. There were no evidences of hemorrhages into the skin or elsewhere. Lumbar puncture showed increased pressure and one-half ounce of bright red fluid was withdrawn, which contained 5,100,000 red cells, 2400 leukocytes, and 90 per cent. hemoglobin. The specimen appeared to be pure blood and would not coagulate. The bulging of the fontanelle disappeared at the time of the puncture but returned fifteen minutes later. Sixty hours after the onset of the first symptoms, treatment by normal human blood serum was begun. During this time the condition of the child became progressively worse so that during the last twenty-four hours he could not be aroused at all, ceased to swallow, and the lack of nourishment and loss of fluid gave him the atrophic appearance of athrepsia.

He was not weighed on account of his poor condition. At this time 30 c.c. of serum was given subcutaneously; six hours later 30 c.c. more. After the second dose the child began to show improvement. He appeared brighter and was able to nurse and the muscular twitching was less marked. Sixty cubic centimeters more serum was given in this twenty-four hours, at the end of which time the twitching had ceased entirely and he was nursing regularly every two hours. At the end of the second twenty-four hours the fontanelle was still bulging and another lumbar puncture was done, drawing off $1\frac{1}{2}$ ounce of blood tinged spinal fluid, showing that active hemorrhage had ceased. Serum administration was continued for five days, the amount being diminished each day. In seven days this baby received a total of 630 c.c. administered in twenty-three doses. Improvement was continuous. At the fourth week he had regained his original birth weight. At two months he weighed 8 pounds, 8 ounces; at three months 12 pounds; at four months 15 pounds. At four months he appeared to be a normal child, having no spasticity, he held his head up, was able to hold objects in his hands, smiled upon provocation and did not show signs of mental insufficiency. To-day he is a normal baby one year and six months old.

B. A., the third child, a male, five and one-half years old, had always been very healthy until the present trouble. One afternoon he received a slight blow on the abdomen from the handle of his bicycle. Following this there was a very large hemorrhage under the skin. A few days later he fell ill with tonsillitis which lasted four or five days. While convalescing from this attack

he had frequent hemorrhages from the nose and some oozing from the gums. About ten days later, on July 10, the epistaxis was very marked, the child vomited a large quantity of blood and passed large bloody stools. The epistaxis and bleeding from the gums continued throughout the 11th. On the morning of the 12th a large quantity of blood was again vomited and many bloody stools passed. On the morning of the 13th again vomiting of blood and bloody stools. At this time I was called to see the child and found him very pale, tossing about the bed with air hunger and so pale the lips were of a color indistinguishable from that of the skin surface. The temperature at this time was 103°, pulse 140, respirations 48. Between 12 o'clock noon and 12 o'clock midnight the child received 240 c.c. of normal human blood serum. July 14, there was a very slight hemorrhage from the nose and some disintegrated blood passed in the stools. After this there was no more bleeding. The serum injections were continued, however, for five days, at the end of which time a total of 1034 c.c. had been administered hypodermatically. After this the child made a slow but steady recovery to its normal condition.

L. M., male child, age ten years. His mother was subject to severe and almost uncontrollable hemorrhages. Patient himself in the past had been subject to prolonged and almost uncontrollable hemorrhages from slight wounds. He was admitted to the Fordham Hospital after having fallen and punctured two wounds in the anterior part of the tongue with his teeth. On admission the tongue was swollen and black and was bleeding steadily from two small puncture wounds near the tip. For the first twenty-four hours he was given calcium lactate, 10 grains every four hours, adrenalin solution to the tongue on cotton in the form of a wet dressing. Bleeding was continuous. Peroxide of hydrogen was applied locally as a wet dressing; bleeding continued. Next day vomited a large clot of blood. Compresses of gelatine solution were applied locally and changed every hour through the night; bleeding continued. Treatment with gelatine, adrenalin, peroxide and calcium lactate, 10 grains every four hours, were continued for four days without the slightest effect. On the fifth day a local dressing of fresh beef serum was made and changed frequently without the slightest effect. On the sixth day 1 ounce of normal human blood serum was injected subcutaneously. The hemorrhage stopped within four hours after receiving the serum and did not return again. The boy was discharged on the fourteenth day very anemic but with no tendency to hemorrhages.

I. J. G., whom I saw in consultation with Dr. Dowd, was a young man twenty-nine years of age. His family and personal history were negative. It was noted by his family and friends that he was always very pale but perfectly well nourished and healthy. Without warning his nose began to bleed and could not be stopped. After he had bled about a pint, according to

the family estimate, Dr. Dowd was called. The nose was packed very tight from both front and back but without effect as the blood lamp-wicked through the packing and continued to drip. The packing was removed several times and replaced tighter each time but still without effect. The hemorrhage reduced his hemoglobin to 65 per cent. and red blood cells to 2,000,000. On the fourth day I began injections of normal human blood serum and within thirty-six hours the bleeding had stopped and did not return.

The underlying condition in these bleeding cases I believe has to do with the endothelium lining the blood-vessels, and I believe a disturbance in the balance of the ferments of these cells is the immediate cause of the hemorrhages. This disturbance I believe to be due to malnutrition. The malnutrition may be caused in different ways but in the end has the same result. In the bleeding babies we find marked putrefaction, hypersecretion of mucus and mal-odors indicative of marked decomposition in the colon. This decomposition is accompanied by the production of toxins which are absorbed and interfere with the nutrition of the endothelium possibly by producing a cloudy swelling, and thereby upset the balance normally maintained between the ferments and antiferments of these cells. In a very recent case of hemorrhage in the new-born a foul odor, identical with that of the stool, was exhaled from the general skin surface. Hemorrhages so commonly reported in specific babies can be accounted for in this way and also those occurring in individuals having a bacteremia. The toxins of these various conditions are equally capable of destroying the normal equilibrium of the endothelium.

A long list of observations have descended to us from the literature which seem to have established the fact that these hemorrhages are due to some abnormal condition of the blood itself, that it is a blood disease. The main facts in support of this conclusion are the delayed coagulation time of the blood and what appears to be an hereditary tendency. In an article entitled "The Relation of the Blood Platelets to Hemorrhagic Disease," Dr. W. W. Duke has pointed out that there is a marked diminution of the blood plates in these hemorrhagic conditions and that when these are supplied by transfusion of blood, the bleeding stops for a time but with the reduction of these elements again the hemorrhages will recur. The blood plates have been demonstrated to be the nuclei about which thrombi form as they produce a ferment substance which is con-

cerned in the formation of fibrin. Such thrombi we find, of course, as hemostatic agents, instrumental in stopping hemorrhage due to blood-vessel injury.

The blood of some of the bleeding cases has a normal coagulation time, but the greater number have the coagulation time prolonged and in some instances decomposition takes place without clotting having occurred.

When normal serum, from whatever source, is added to the blood of any of these cases which have a much prolonged coagulation time, it will cause a prompt clotting. From this fact it has been reasoned that there is lacking in the blood of these individuals a kinase, or activating substance which would normally cause coagulation. If this were true we should expect to find a coagulation of the blood in the hemorrhagic areas in those cases in which the hemorrhages have been controlled by the use of serum but this is not the case. Clotting in the tissues does not occur after the use of normal human blood serum. The hemorrhage is stopped through some other process than that of coagulation and the blood of existing hemorrhages is absorbed without having formed clots. The effect of normal human blood serum in controlling those hemorrhages seems to be through its nutritional effect especially upon the endothelium lining the blood-vessels.

These hemorrhages usually occur after some special disturbance of nutrition. This disturbance may be more or less chronic with considerable wasting away of the general tissues before the hemorrhage begins. In other cases it seems to be more acute and a condition of toxemia or septicemia. In the first instance, a species of autointoxication results, originating in the excessive growth of pathogenic bacteria in the intestinal tract with the absorption of large quantities of toxins. In the second instance, a septicemia occurs, with a growth of bacteria in the blood stream which produces a profound systemic poisoning. All of these conditions have the same general effect upon the nutrition of the endothelial lining of the blood-vessels. This disturbance operates to upset the balance normally maintained between the ferments and antiferments native in the cells and thereby producing conditions leading to hemorrhage. The normal human serum is a prepared food having molecules with receptors which fit the receptors of the cells of the endothelium, according to the side-chain theory of Ehrlich, which in that way is capable of being incorporated into the cell body as nourishment without any

energy being wasted in the process of digestion. The nutrition being thus easily restored, the balance of ferments is reestablished and the hemorrhages stopped.

In septic conditions normal human blood serum appears to have considerable value. I have injected four individuals having bacteremia, from the blood of whom the streptococcus was obtained by culture. Two of these individuals recovered and two died. Two cases of very grave peritonitis have also received these injections. The first, a postoperative case, on whom a pan-hysterectomy had been done, showed marked signs of acute peritonitis on the day following the operation. Beside high fever, rapid pulse, marked abdominal tenderness and distention, she had from the second day, uncontrollable vomiting. She was unable to take any nourishment whatever and was rapidly sinking. Injections of normal human blood serum in doses of 5 to 7 ounces were given daily. After the second dose was administered she showed decided improvement in that the vomiting ceased, she was able to take liquid by mouth, the temperature receded and the abdominal condition quickly cleared up.

The second case, a girl nineteen years old, curetted after abortion, ran a high temperature between 103 and 104, with rapid pulse, shallow rapid respirations, distended tender abdomen, flushed cheeks and dry mouth. This girl was considered in a hopeless condition when injections of human serum were begun. Over a period of five days the serum was administered to the amount of three hundred cubic centimeters. The serum caused a decided improvement and the patient returned slowly, to her normal health.

The injections of human serum I have made in meningitis caused by the staphylococcus, streptococcus and pneumococcus have proven of no value possibly because these cases have been so far advanced in the degenerative processes caused in the parenchymatous organs by the bacterial toxins that recovery was impossible, though the bacteria may have been killed or their toxin neutralized.

There is a possible explanation for the beneficial action of normal human serum in septic conditions. Lack of resistance on the part of the individual to organisms may be due to one or two factors. The individual may have the ability to produce sufficient antibody but have a deficiency in the complement content of his serum. Again he may have sufficient complement but lack the ability to form antibody. In the first instance the

complement would be supplied by the normal serum injections. In the second no benefit would be derived because the normal antibody in any given serum is a negligible quantity. The second class should be benefited by the administration of an appropriate antiserum, produced specifically against the infecting organism. I believe we are approaching methods by which we can fairly accurately determine which element is lacking in the blood of septic persons and it will not be in the very distant future when we shall be able to direct much more intelligent treatment in any given case.

Injections of normal serum have proven of value in controlling hemorrhage which occurs after operation on deeply jaundiced persons. In co-operation with Dr. Willy Meyer I have made injections in such conditions with good results. Dr. Meyer has reported this work in the *Journal of Surgery, Gynecology and Obstetrics*, August, 1911.

In passing, just a word in regard to the injections of defibrinated blood which is advocated by some who have used it. Experiments made by Ehrlich have demonstrated that the red blood cells injected into the same species call forth a hemolytic body for their digestion and removal, which he calls isolysin. In the formation of the isolysins a certain amount of cellular energy is consumed in their production which is just so much extra tax on the individual's capacity for general resistance. The serum is so easily obtained I can see no reason for using whole blood, especially in babies, thereby possibly reducing the strength of the child already at its lowest ebb.

Transfusion, which has been so much employed, is of value but it is accompanied by certain dangers. Hemolysis, thrombosis and embolism all or any of which may lead to the death of the patient, are to be feared. It is true that there are not very frequent occurrences but still they are common enough to make one hesitate before using transfusion if some other efficacious remedy can be employed. The disadvantages of transfusion are, first, the difficulty of the operation which is not so simple as many suppose; second, it is frequently necessary to use the method several times on the same subject and in this it has certainly a great disadvantage, while on the other hand, normal human blood serum can be repeated frequently and used indefinitely. I do not wish to disparage too much the use of transfusion, for I believe it has a field which no other agent or measure can replace. In cases of very marked depletion from prolonged hemorrhage in

which the cellular elements of the blood are greatly diminished, I believe the only measure to use is transfusion, for in this operation we supply the cells necessary to the blood which are entirely lacking in any serum we may administer.

138 WEST SEVENTIETH STREET.

REPORT OF A CASE OF DELIVERY THROUGH THE PERINEUM.

BY

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SPONTANEOUS delivery of a child through the perineum or rectum is so rare that the report of its occurrence is almost imperative.

The following case occurred in the free service of the Jewish Maternity Hospital.

No. 1922. Mrs. S. W., twenty-six years old, Austrian, began to menstruate at fourteen, regular and painless, married four years ago. Menstruated last in the early part of August, 1910.

She began to have labor pains May 2, and was admitted to the Hospital at 7.30 P. M. Vaginal examination revealed the cervix two fingers dilated; membranes intact. Head in the L. O. A. position; the pelvis roomy. No anomalies in the construction of the vagina and pelvic floor were noticed. She was in active labor having pains every five to seven minutes and apparently was expected to go through a normal and spontaneous delivery.

At 10 P. M. the attending nurse noticed an unusual amount of bulging of the anterior wall of the rectum and the perineum. This was increased with each succeeding pain. She hurriedly summoned the house surgeon Dr. A. Urevitz who was quite alarmed at the condition he was confronted with and sent for me. Upon my arrival one-half hour later I found the patient in very active labor, the head pressing on the pelvic floor, stretching the anterior wall of the rectum and the whole pelvic floor in front of it. As the head advanced the parts became more thinned out and it was evident that the parts would not withstand the strain and that the anterior wall of the rectum would be torn away. No mechanical manipulation to make the head extend in order to relieve the tension on the pelvic floor was of any avail, and rupture of the perineum at the junction of the rectum soon took place, the head presenting, and the child delivering itself through this artificial opening, leaving the vulvar orifice intact and a bridge of the perineum $1\frac{1}{2}$ inch wide separating it from the newly created opening. The placenta was also delivered through the perineal opening.

The repair of the damaged pelvic floor was now undertaken, the external bridge of tissues was cut in order to be able to expose the field of operation. On examination it was found that the rectum was intact, that the tear in the right sulcus was $3\frac{1}{2}$ inches in the left, about $2\frac{1}{2}$ inches, that all tissues to internal sphincter were lacerated and the entire pelvic floor had the appearance of an irregularly badly lacerated surface, but the anatomical structures could with some difficulty be differentiated.

The pelvic floor was repaired in the usual manner which resulted in very good union and she was discharged from the hospital on the sixteenth day.

A review of the literature on the subject reveals how infrequent this condition is met with. There are only a few cases recorded.

King reported seven collected cases of delivery through the rectum, before the Edinburgh Society. Published in Paris in 1793. (Reter: *Memories Di Soc. Med. Di. Geneva*, 1883.)

McMullen (*Australian Med. Gaz.*, Sydney, 1889) reports a case of complete rupture of the perineum involving the rectum for $1\frac{1}{2}$ inches with loss of control of the sphincter ani. He does not mention whether the vulvar orifice remained intact. (Nicholson: *University of Penn. Med. Bul.*, Central Perforation of the Perineum; Delivery through the Perineum.)

S. Rice, Springfield, Ohio (*Med. Brief*, St. Louis, 1896) reports the following interesting case:

In April, 1893, he was asked to see a young woman who was supposed to be seven months pregnant. She was very pale and anemic, gave a history of loss of blood on two different occasions. On vaginal examination the os was hard to find, it was drawn up and impacted under the pubis. The placenta was bordering on internal os. Shortly afterward patient had a third hemorrhage but did not call a physician. Dr. Rice did not see the patient again until June. In the meantime patient has been under treatment by fifteen different physicians, each diagnosing the condition differently. On examination the head was found in the rectum and the remainder of the body in the uterus. Patient was in very poor condition and no anesthetic could be administered. A week later the bones of the head began to pass through the anus and in two weeks more the rectal delivery of the body of the fetus was completed. (Parochin: *Rupture of the Recto-vaginal Septum in Labor.*, *Vrach. Gaz. St. Petersburg*, 1903.) (Dealmeida: *Central Rupture of the Perineum, Delivery through the Perineum.*, *Brazil Med.*, Rio De Janeiro, 1904.)

M. J. Marsh (*The Phila. Med. Council*) reports the following case:

Patient twenty-one years old, weighs 220 pounds, ii-para. Doctor arrived after patient had precipitated. On palpation, uterus was still not completely emptied and no cord either in or

protuding from the vulva. On more careful examination the cord was discovered protuding from the rectum. There was a longitudinal tear through the entire posterior wall of the vagina and for a corresponding distance in the anterior wall of the rectum, anus was a dilated and presented three small tears. Vulva and perineum were intact. Child weighed 6 or 7 pounds.

A. J. Karols Kent (*Jr. of Am. Med. Ass.*, March 5, 1910). Patient forty years old; ii-para. Small and sparely built. When called patient was two hours in labor. Perineum was bulging. On attempting to support and guide the head under the arch perineum gave way, the head was born followed immediately by the body. There was a complete laceration of the sphincter ani and the right labium majus was torn loose for the lower two-thirds.

The cases cited above practically cover the literature on the subject but some of the cases are not reported in detail and are not as typical as the case reported here.

It is difficult to account for the fact that a central perforation of the perineum may take place spontaneously. There are so many factors which govern the perineal stage of labor in its relation to perineal tears and the causes thereof that to single out one mechanical or anatomical defect as the cause would be hardly justifiable.

Of all the theoretical explanations regarding its etiology those of Savage, Varnier, and Nicholson are probably the most satisfactory. If we add to these Klien's conception of the principles governing the pelvic outlet, I believe most of the perineal or rectal deliveries can be explained. Savage in his discussion of rectal vaginal tears points out that the space designated by Dubois and Lenoble as the "linus recto-perineale" which is limited in front by the transversus profundus perinei and constrictor vulvæ and behind by the lavator ani; is devoid of all muscular structure and is formed exclusively by the opposition of the vaginal and rectal septa. This portion of the pelvic floor may become the point of origin of special varieties of perineal tears if anomalies in the mechanism of this stage of labor are present.

Varnier in his thesis dealing with the mechanism of the distention of the perineum during the period of expulsion has shown that the posterior part of the perineum measures an average of about 7 cm. and the coccy-vulvæ space 14 to 15 cm. The perineum thus distended hides the bregma which we feel at the level of the anterior wall of the rectum. Any abnormal orientation of the vulva in exaggerating these unfavorable conditions will bring about a tear in the rectovaginal septum.

The vulva being oriented upward and forward part of its orifice is obstructed by the symphysis pubis, which even in a pelvis with average dimensions acts as a crossbar to the advancing head. During the period of expulsion, this particular position renders abnormal the physiological mechanism which brings about the progression of the head through the vulva. Under normal conditions the reactions of the perineal band which continues through the sacrococcygeal curve serves to direct the head toward the orifice of the vulva. But when the vulvar opening is barred by the symphysis pubis, the reaction of the perineal band only tends to prop the head against the posterior aspect of the pubis. The abdominal and uterine contractions drive the head directly downward and thus distend the perineum to extraordinary dimensions. The thin rectovaginal wall deprived of muscular fibers which give support to it, becomes much distended and when the limit of resistance is reached, the head breaks through either the perineum or the rectovaginal septum. While I fully concur with the above explanations which surely are important etiologic factors, still I believe that our study of this rare obstetric complication will be incomplete if we fail to consider as an important element the construction of the pelvic outlet, particularly as pointed out by Klien. He divides the outlet by drawing a transverse line between the tuber ischii, dividing it into anterior and posterior segments.

Now for some reason, due either to a narrow and flat pubic arch or an overdeveloped head, the head is unable to engage itself in the anterior segment of the pelvic outlet, and therefore extension of the head does not take place at a point on the pelvic floor where it normally should. Thus the axis of power is not changed from the posterior pole of the head to the anterior pole, which normally takes place. The force produced by the uterine and abdominal contractions with the head not begun to extend, the axis will still remain unchanged and will cause more flexion of the head, thus greatly distending the perineum and the anterior rectal wall. As soon as the limit of resistance is reached the weakest portion will break through, usually at the junction of the perineum and the child delivers itself through it leaving the vulvar orifice intact.

In offering this physical law as an explanation for this complication, I do so with the full knowledge that it may fail of support in a number of cases in which the tear commenced in the upper part of the pelvic floor before the head actually began to distend

the perineum, and that in these cases some anatomical defect in the construction of the pelvic floor must have existed. But once the perineum commences to be distended and a central perforation takes place it must, in a majority of cases be due to improper extension of the head because of a small or contracted anterior segment of the pelvic outlet.

154 HENRY STREET.

TRISTRAM SHANDY AND OBSTETRICS.

BY

W. H. ALLPORT, M. D.,
Chicago, Ill.

DR. CROSS's recent history of the "Life and Times of Laurence Sterne,"* revives an interest, which the medical profession should never have allowed to languish, in the "Life and Observations of Tristram Shandy, Gent."

Of all English fiction writers Laurence Sterne has given us the clearest picture of the obstetrical customs of his time and country. But Sterne's wit was an exasperating one and could never touch any subject either directly or seriously or reverently. Furthermore, even his unblushing and irreverent imagination had to stop short at the door of the upper chamber where Tristram Shandy†—already nine months afloat on a sea of bad luck—lay becalmed for fifty-four chapters while passing through the narrow straits, and while his father and Uncle Toby and Dr. Slop were discoursing in the parlor below on every subject under the sun from noses to fortifications. For Sterne was a minister of the church of England and knew to an inch how far his double-edged weapon would be allowed to cut without unfrocking him. But sitting just outside that forbidden door he still manages, in an unparalleled satirical frolic, to hold the mirror up to most of the scientific, obstetrical, and religious weaknesses of the eighteenth century.

Mrs. Shandy was to be entitled under her marriage contract to go up to town for her first lying-in, but should she "through false cries and tokens" delude her husband into an unnecessary journey to London, she would have to even matters up by submitting the next time to an accouchement in the country.

* MacMillan's.

† The word "Shandy" is still current in Yorkshire for an individual who is "gay, unsteady, crack-brained." Tristram was certainly well-named.

As might have been expected, such a contingency actually arose, and it was to this unlucky contract and the subsequent error in his mother's judgment that poor Tristram attributed the defacement, or effacement, of his nose by the forceps of a country obstetrician.

Just 280 days prior to Tristram's advent into the world, Mrs. Shandy consented—"as they lay chatting gravely in bed afterward, talking over what was to come"—thus to balance the last year's journey by lying-in this time in the country. Mr. Shandy contended that the dangers of such a confinement would be somewhat mitigated by employing Dr. Slop, a local celebrity, living only eight miles distant, "who had devised many curious improvements for the quicker extraction of the fetus in cross births." The doctor "was a little squat, uncourtly figure of about 4 1/2 feet perpendicular height, with a breadth of back and a sesquipedality of belly which might have done credit to a sergeant in the horse guards." He had lost his front teeth through the unfortunate slipping of his forceps during a previous delivery.* "My mother, on the other hand, was absolutely determined to trust her life, and mine with it, into no soul's hand but that of a licensed old woman whose only claim to her confidence lay in the fact that, in the course of twenty years' practice in the parish, she had brought every mother's son of them into the world without any slip or mishap which could fairly be laid to her account." After Mr. Shandy "had done arguing the matter with his wife as a Christian and came to argue it over again with her as a philosopher and had put his whole strength to it 'depending upon it as his sheet anchor,'" he got the worst end of the argument—of course; and they finally agreed to compromise. Within three days after the above conversation, Mrs. Shandy completed her arrangements with her midwife, and Dr. Slop was engaged to drink a bottle of wine with Mr. Shandy and Uncle Toby in the back parlor during the ceremonies. No one knows what the midwife

* Dr. Slop was really Dr. John Burton, a Papist man—midwife. No one could doubt who was intended by "the little, squat, uncourtly figure waddling through the dirt upon the vertebræ of a diminutive pony" out to Shandy Hall to try his newly invented forceps upon the head of Mr. Tristram Shandy, Gent. "Dr. Burton, woefully lacking in a sense of humor, solemnly disclaimed all resemblance to the caricature Sterne had drawn of him. Then another doctor of the neighborhood, thinking Sterne might have meant him, called the parson up one morning, and entered a vigorous protest against the indecent liberties taken with him. After vain attempts to convince the doctor of his error, Sterne lost patience and remarked sharply: 'Sir, I have not hurt you; but take care; I am not born yet; but heaven knows what I may do in the next two volumes.'"

charged, but whether Dr. Slop did or did not take any otherwise active part in the deliverance, he was to be paid five guineas.

Shandy *père* was a man of wide reading, and rejoiced in an active imagination which during the ensuing nine months was given full play. He had views which would have done full credit to many of our present-day obstetricians. In fact, many of his theories still have a suspiciously modern flavor. For example, he saw in Cesarean section less danger to the child than in difficult and prolonged labors; and even went so far as to advocate prompt recourse to that procedure whenever labor even threatened to become obstructed. He mentioned this one day to Mrs. Shandy, remarking casually that certain towering geniuses—notably Julius Caesar, Hermes Trismegistus,* Scipio Africanus, Marius Torquatus, and Edward the Sixth—all came sideways into the world; “but seeing his wife turn pale as ashes at the very mention of it, as much as the operation flattered his hopes, he thought it as well to say no more of it.”†

While Uncle Toby was demonstrating the mathematics of fortification in the kitchen garden with the aid of Corporal Trim, and bragging interminably about “what prodigious armies we had in Flanders,” the elder Shandy was pondering the mechanics of childbirth and evolving still another theory which has but recently come again to the surface. “It is of the nature of an hypothesis, when once a man has conceived it, that it assimilates everything to itself, as proper nourishment; and, from the very moment of your begetting it, it generally grows the stronger by everything you see, hear, read, or understand.” It suddenly dawned on the squire that the reason for the intellectual stature of the just mentioned worthies was that their brains had not been subjected to obstetrical pressure either through the application of forceps or through maternal efforts during prolonged labor. “By heavens!” cried he, “the world is in conspiracy to drive out what little wit God has given us, and the professors of the obstetric art are lifted into the same conspiracy! What is it to me which end of my son comes foremost into the world, provided all goes right after and his cerebellum escapes uncrushed!” Hence, in cases refusing

* After whom Tristram would have been named but for an unfortunate misunderstanding between the nurse who held the child up for baptism and the parson who did the christening.

† Not to name others like McDuff, who perhaps flourished but in Shakespeare, and only there in order to make the witches' prophecy come true. The reader will of course also recollect that Apollo is said to have cut the living Aesculapius from the body of the dead Semele.

Cesarean section, Mr. Shandy strongly advocated that podalic version* should be substituted. In these views Mr. Shandy held not only the sanction of Dr. Slop, but he seems to be once more in accord with the theories advanced by some of our most modern writers, who have shown recently that in certain labors the soft brain and its easily ruptured blood-vessels are to their great detriment squeezed part way through the foramen magnum during the parturient effort. To quote Dr. Slop, "it would astonish you to know what improvements we have made of late years in all branches of obstetrical knowledge."

The obstetrical moment finally arrived, but Dr. Slop, whose visit that day happened to have been a purely casual one for the purpose of inquiring after Mrs. Shandy's health, had unfortunately left all his modern improvements hanging at the head of his bed in a green baize bag between a pair of pistols. Obadiah was sent post haste—eight miles and return—after the *tire-tête*, the crotchet, the vectis, the fetus-hook, the newly invented forceps, and the papistical baptismal squirt.†

In spite of this extensive tokological armamentarium which came back around Obadiah's waist, and which rattled ominously each time the gray coach horse took a leap through the mud, the reader will note that Sterne makes no mention of the Davidson syringe, the Barnes bag, the Kelly pad, and other modern India-rubber adjuncts without which now-a-days no infant of any social standing consents to uncover its face. For the obstetric art was then in its infancy and even the forceps or "tongs" or "extractors" were novelties in Dr. Slop's time. Tristram—whose memoirs commenced to appear in 1760—could not have been born later than 1730, and the wonderful secret instruments of the Chamberlen family did not come into general use much before that date. Deventer describes them as curiosities in 1716, and Heister pictured them crudely even in 1724.

As to the Kelly pad, the present writer can find no reference to it at any date earlier than that of the Dublin Rotunda, *and none even in the records of that institution*; but the name would strongly suggest that the pad might have come into use first through the Kellys of Dublin, who probably flourished there and then, and who undoubtedly enjoyed—both as practitioners and patients—large opportunities at the Rotunda lying-in hospital. As against this fascinating hypothesis may be raised

* As originally practised by Ambroise Paraens.

† Undelivered infants, still living but in extreme peril, were baptized by injection.

the plain fact that Goodyear first succeeded in vulcanizing rubber in 1844, so that if the pad was in existence prior to that time it must have been constructed of some material other than vulcanized rubber. A branch of the Kelly family settled in Maryland, where some of its members are still said to be engaged in medical practice. Possibly the pad found its way into America with this family, very much as did the "tongs" which were first invented and used in England by the Chamberlens, a family of French Huguenot refugees. This question presents an inviting opportunity for a future obstetrical memoir in the style of some of the valuable publications issued from time to time by our institutions for higher research.

None of the modern improvements which the jingling Obadiah brought back on the coach horse to Shandy Hall seem to have been called into favorable action to save poor Tristram's nose.

"Bless my soul!—my poor mistress is ready to faint—and her pains are gone—and the drops are gone—and the child is where it was, continued Susannah—and the midwife has fallen backward over the edge of the fender, and bruised her hip as black as your hat. 'I'll look at it,' quoth Dr. Slop. There is no need of that, replied Susannah—you had better look at my mistress—but the midwife would gladly first give you an account how things are, so desires you would go upstairs and speak to her this moment."

Sterne, unhappily for the reader's curiosity, lets Dr. Slop, in response to the call of the midwife for help, go above stairs unaccompanied, and we have to wait for our next sight of the doctor until he appears in the kitchen, after the ceremony is all over, "making a bridge" under the observation of Corporal Trim. Uncle Toby, whose mind dwelt perpetually on war and fortifications, thought the obliging doctor was constructing a model, such as had been previously under discussion in the parlor, of the Marquis d'Hopital's draw-bridge used at the siege of Dunkirk—and sent the doctor his thanks accordingly.

"God bless your honor, cried Trim, 'tis a bridge for young master's nose—in bringing him into the world with his vile instruments—he has crushed his nose, Susannah says, as flat as a pancake to his face; and he is making a false bridge for it with a piece of cotton and a thin piece of whalebone out of Susannah's stays to raise it up." "Lead me, brother Toby, cried my father, to my room this instant."

Interesting, also, in this connection, are the views quoted

by Sterne from certain of our scientific forefathers, relative to the obstetrical and other causes of variations in the shape of the nose. A certain Prignitz, for example, is quoted as holding that the nose, being filled mostly with blood and animal spirits, and these in turn being impelled and driven by the warmth and force of the imagination, develops in direct arithmetical proportion to the excellency of the wearer's fancy. Scroderus, on the other hand, believed Prignitz quite wide of the truth, and held to a directly contrary theory—namely, that the nose begat the fancy. The great obstetrical authority, Ambroise Paraens—at least a modern in his materialism—held that both of these worthies were not much better than guessers, and proved conclusively that, barring accidents during parturition, the length and goodness of the nose was in inverse proportion to the softness and flaccidity of the nurse's breast—and that by sinking into it, as into so much butter, the nose was comforted, nourished, plumped up, refreshed, refocillated, and set agrowing forever.

607 RUSH STREET.

TRANSACTIONS OF THE SOCIETY OF THE ALUMNI OF THE SLOANE MATERNITY HOSPITAL.

Meeting of January 26, 1912.

The President, EVERETT W. GOULD, M. D., in the Chair.

DR. WM. H. WELLINGTON KNIPE presented a

REPORT ON A CASE OF OSTEOMALACIA.*

DR. J. G. HOPKINS read a paper on

THE EFFECT OF CHLORAL POISONING ON THE LIVER AND KIDNEYS.†

DISCUSSION.

DR. E. B. CRAGIN who opened the discussion believed that all who were working in obstetrics would appreciate the experimental work regarding the action of chloral presented in the paper read by Dr. Hopkins. The impression has prevailed quite generally that chloral resembled chloroform in its action. It had been demonstrated that ether was safer than chloroform in toxemia and eclampsia and if chloroform was unsafe, it was

* For original article see page 582.

† For original article see page 557

perfectly logical to ask if chloral was any safer. Dr. Cragin believed, however, that the experimental work described by Dr. Hopkins in his paper would justify the use of chloral without fear. As far as the liver was concerned, the organ which was more apt to be affected than any other, the lesions appeared to be slight. Regarding the interpretation of the autopsy findings in dogs' kidneys after the use of ether, chloroform, or chloral, it was noted that although a great deal of fat would be observed in some kidneys after chloroform administration, normal dogs were occasionally found in which the kidneys likewise contained a large amount of fat and he believed that the amount of fat in the kidneys of the dogs used in these experiments was relatively of little importance. Dr. Cragin said that he felt under personal obligation to Dr. Hopkins for this work, of such importance to all interested in the problems of toxemia and eclampsia.

Dr. J. E. WELCH read a paper on

NORMAL HUMAN BLOOD SERUM IN OBSTETRIC AND PEDIATRIC PRACTICE.*

DISCUSSION.

Dr. WILBUR WARD said that since 1909 they had used injections of normal rabbit serum in these cases at the Sloane Hospital. Induced by the published reports of the efficacy of rabbit serum in general surgical practice as a prophylactic measure in those cases of jaundice, etc., where hemorrhage was feared, he had, early in 1909, used rabbit serum in a baby which showed the typical hemorrhages of hemophilia neonatorum. One injection of 12 c.c. was given and the bleeding promptly ceased. Encouraged by this result, rabbit serum was used thereafter in all cases of hemophilia at the Sloane, with the exception of the last case in the series, where human serum was used.

In looking over the Sloane records recently, Dr. Ward had found that since January 1, 1909, in a series of over 5350 confinements, there had been eight cases of hemophilia. This number did not include those in which there was simply a slight nose-bleed, or the passage on one or two occasions of a small amount of blood from the rectum; such cases were more or less common and as long as the bleeding had been slight, no treatment had been given, and they were not counted among the "bleeders." Furthermore, ecchymotic spots about the ankles or on the buttocks in those babies requiring resuscitation at birth were ascribed to trauma and excluded. It is of interest that there has been no "bleeder" at the Sloane since December, 1910, in over 2000 confinements.

Of these eight cases of hemophilia, four died, a mortality of 50 per cent.—not to be compared to Dr. Welch's results. In the four cases that recovered, all typical and marked "bleeders," the injections of rabbit serum controlled the hemorrhages

* For original article see page 597.

promptly, and the satisfactory results seemed undoubtedly due to the serum.

There were several points of interest in the fatal cases. All were premature, ranging from eight to eight and a half months. One was so markedly specific at birth that the mother and baby were isolated at once, a week before the hemorrhages began. In another the history as regards syphilis was very suspicious. In the rest no specific history could be obtained, and in none of the cases was there any history of bleeding in the family.

The dosage of the rabbit serum was small—one single dose of from 10 to 15 c.c. being all that was given in any one day. As Dr. Welch has pointed out, this was entirely insufficient. But Dr. Ward felt that they were exploring new territory at that time, and was cautious about the injections, especially as in the very first case alarming symptoms were noted following the injection. The 12 c.c. of rabbit serum was given at 11 A. M. and the hemorrhages promptly ceased. No immediate untoward effect was seen, but after the lapse of about four hours, the baby became white, pallid, and while the feedings were taken well and the general condition seemed satisfactory, the color of the child excited alarm. The pallor lasted about six hours and then disappeared; no further symptoms supervened and the baby made a good recovery. This was interpreted as evidence of a possible hemolytic or other obscure reaction, and for this reason the injections were given sparingly and cautiously. In no other case was any reaction noted. Dr. Ward asked if Dr. Welch had noticed any such effects in any of his cases receiving human serum. Dr. Ward added that the case which received human serum was one of the fatal ones, but here also, the dosage was small, and as is now known, insufficient.

He also said that there could be no question, in comparing these results with those of Dr. Welch, that the use of human serum was practically, as well as theoretically, to be preferred to the use of rabbit or other sera.

However, conditions might arise in private practice, especially among those who had no active hospital connections, where human serum could not be secured at once, and in these cases rabbit serum, obtained from any of the laboratories, might be substituted. Furthermore, certain firms have prepared and put on the market normal horse serum for just this purpose, and some of the reports on its use have been encouraging. While the preference must remain with human serum, in cases where this cannot at once be obtained, rabbit or horse serum might perhaps be substituted with good results.

DR. F. A. DORMAN referring to the apparently hopeless character of the cases of hemophilia which they used to see at the Sloane, stated that it was nevertheless a rather common experience to have these apparently exsanguinated babies suddenly start to get well rapidly. A factor of interest in connection with these cases was that the use of mercury would often cause the

bleeding to stop. The good results obtained with Dr. Welch's method of serum injections must nevertheless be regarded as reassuring and decisive.

DR. E. B. CRAGIN recalled a similar observation to that referred to by Dr. Dorman, namely, that a number of these babies would bleed until they could take nourishment properly, after which they seemed to get well. It was possible that the endothelial lining cells of the vessels became favorably influenced by improved nutrition, and in this way brought about a cessation of the hemorrhages. It appeared as if these babies would get well as soon as they could be properly fed for three or four days, no matter whether mercury, castor-oil or other drugs had been administered.

DR. O. P. HUMPHSTONE said that his experience included ten cases of hemophilia neonatorum. The last one began to bleed after circumcision. The baby was given 10 c.c. of human blood serum and iodoform gauze saturated with adrenalin was applied to the operative wound, after which the bleeding temporarily ceased. After a few hours the bleeding began again and a total of 30 c.c. of the human blood serum was given during the next twenty-four hours. Bleeding continued slowly but steadily and the baby died at the end of forty-eight hours. He now realized that the dosage was not sufficient. He had recently also seen a striking manifestation of its efficacy in persistent epistaxis. Dr. Humphstone employed serum which had been obtained from the placental blood and he desired to ask Dr. Welch what experience he had had with the same. He also referred to the possibility of prophylactic treatment in the mother, in cases where previous children were known to have died from hemophilia.

DR. W. H. W. KNIPE referred to a case seen at the Post-Graduate Hospital in which bleeding occurred after separation of the umbilical cord and resisted every surgical measure employed to control it. Normal human serum was used in this case but the child only lived forty-eight hours and Dr. Knipe believed that the use of the serum had probably not been taken sufficiently early. The case referred to was the only instance of hemophilia which had occurred in their hospital obstetrical service in a year.

DR. J. E. WELCH in closing the discussion stated that he had had no personal experience with rabbit's serum. Wile's original article dealt with the use of animal serum in hemorrhages, especially rabbit's serum, but also included the use of the serum of the ox and the horse and in a certain proportion of his cases the hemorrhages stopped with the use of these sera. Wile stated that although small doses would stop the hemorrhage, larger ones only seemed to increase the trouble. Since the publication of his article, many observers have worked along these lines, and it was found among other things that the complement had been diminished and the blood pressure lessened by the serum injection.

tions. As the babies treated were already in a condition of shock these injections seemed to increase the same.

The speaker could not say definitely whether in the cases reported, the hemorrhage was due to a true hemophilia or to trauma, but in the statistics of the Lying-In Hospital it was shown that of eighteen cases classified as hemophilias, seventeen died. It was unfortunate that in many instances the serum was not employed at once and that the child was in a very much reduced condition when the treatment was started. Dr. Welch stated that one reason why the use of horse serum was not advisable was because the complement as a rule deteriorated rapidly and this complement in the serum constituted a very important feature, therefore the serum should be administered in as fresh a condition as possible and never if more than three or four days old. The dosage must be determined for each individual case, for in some instances the hemorrhage was controlled with from 15 to 20 c.c., while others would not respond to this dose at all. Dr. Welch said that he usually started with 30 c.c. of the serum, and in many cases it was found necessary to repeat this dose every four or six hours or even to increase the dose. The manner of giving the serum was also very important. A fine needle should be employed, and after the injection, local massage should be used in order that the serum might be speedily absorbed by the circulatory system. Replying to the question regarding the intravenous method of using serum, he had once employed 10 ounces in a woman who was suffering from streptococcemia. It caused dyspnea, very rapid heart action, general cyanosis and a temporary comatose condition. The patient died a few days later without having manifested any improvement. The symptoms noted were very alarming while they lasted but soon passed away. However, they caused him to fear the intravenous method.

Dr. Welch referred to the importance of obtaining the human blood serum in a proper manner and described the collecting flask which had already been illustrated in his previous articles on this subject. He referred to the importance of having the tube and its connections thoroughly sterile and not exposed to the danger of contamination. The needle should be inserted in the most prominent vein at the elbow and 8 or 10 ounces of blood withdrawn. Regarding the mortality in his cases he stated that he had lost none from hemorrhage. One baby which had moderate hemorrhages stopped bleeding after the injections but died a few days later of a staphylococcemia, the staphylococci being found in the cerebrospinal fluid. The speaker said that he had had no experience with the use of placental blood, as he considered there was always more or less hemolysis in the blood from the placenta owing to the free hemoglobin and that it would therefore be harmful to use it.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of January 9, 1912.

The President, WM. E. STUDDIFORD, M. D., in the Chair.

ROENTGENOGRAPHIC PELVIMETRY.

DR. WILLIS F. MANGES of Philadelphia demonstrated the technic of taking pelvic measurements by means of the x-ray. In introduction he said as follows:

When I received your invitation, more than two months ago, to read a paper on this subject, I looked forward to this evening with great enthusiasm. I had then in my possession a collection of roentgenographs of cases of contracted pelves.

On the seventh of December the building in which my offices were located was almost completely destroyed by fire. All of my negatives were ruined, so that I will be unable to show you more than the few roentgenographs of actual cases which I have been able to collect in the last few weeks.

My first thought was to ask you to cancel the engagement for this evening, but on further consideration decided that the value to you on this occasion would depend, not upon a series of roentgenographs, but rather upon an actual demonstration of the technic or, in other words, upon putting the method to a test in your presence.

Very little work has been done in this field. In a German hand-book on roentgenology, by Gocht, published in 1911, there are a few references made to methods of determining the diameters of the pelvis by means of the x-ray. Faber and Vanier are mentioned. The *American Quarterly of Roentgenology*, July, 1907, contains an article, by Pfahler of Philadelphia, entitled: "Radiographic Measurement of the Diameters of the Female Pelvis." Pfahler's method would be of value if women were all of one build. It is necessary, in his scheme, to have the pelvic brim on a plane parallel to the sensitive plate, to have the focus tube directly above the center of the pelvic inlet; to know the distance between the pelvic brim and the sensitive plate; and the distance of the focus point from the plate. He devised a piece of apparatus which helped materially to bring about these conditions, but the differences in contour of different women made it difficult in many instances, and his measurements were made from a single negative. My own efforts in this work were put forth at the request of Prof. E. P. Davis, of Philadelphia.

The technic of the reader's method was described at the meeting of The American Roentgen Ray Society in 1910, and was published in the *Quarterly* during that year. Briefly stated, it

is a combination of stereoroentgenography, and cross-thread localization, both of which are well established procedures.

Roentgen ray pelvimetry should not be resorted to in the early months of pregnancy, because of remote possibility of harm to the embryo. After the third month, however, no ill results should follow the short exposures necessary for this method of measurement. In fact, we believe that unhealthy conditions during gestation might be improved by moderate roentgenization. During the last two months of pregnancy it becomes more difficult if the patient is of the short and thick type, but at this time the added information of position of the fetus, the presence of single or twin pregnancy, and at least one diameter of the fetal head may be gained.

It is unnecessary to tell you of the different types of pelvis. No new conditions are discovered by this means. They are merely recognized and recorded.

The duty of the roentgenologist in this procedure is fulfilled when he has recorded the actual measurements of the diameters of the pelvis. The variation from the normal, and the plan of treatment must be decided by the obstetrician.

Any number of diameters may be measured, or the distance between any two portions of the pelvis may be ascertained.

It has been my custom to record the following measurements: Anteroposterior, *i.e.*, from the pubic junction to the promontory of the sacrum; two oblique; the maximum transverse; and the interacetabular. The outlet can be measured also if desired.

The oblique and transverse dimensions are easily obtained regardless of the size of the patient. The conjugate presents more difficulty in stout women or in the later months of pregnancy, for the reason that it is difficult to distinguish the shadow of the prominence of the sacrum or to place the patient in such a position that the shadow of the prominence of the sacrum will be isolated. One can, however, distinguish the dense bony edges that bound the sacral foramina, and use the uppermost of these as a guide. If we measure from the anterior surface of this part of the sacrum to the pubic junction and deduct one-half inch, we will have the true conjugate within a quarter of an inch. In cases of congenital deformity, or destruction by disease, or injury of the sacrum, this rule may be overlooked and a more fitting point be found, from which to measure.

No special skill is required in carrying out this technic. The test is being made in your own laboratory and with the apparatus and subjects furnished here.

Meeting of February 13, 1912.

The President WM. E. STUDDIFORD, M. D., *in the Chair.*

SPONTANEOUS RUPTURE OF THE UTERUS DURING LABOR.

DR. GEORGE L. BRODHEAD reported this case. The patient was thirty-three years of age and was first seen at the Post-

Graduate Hospital in December, 1911. Her menses began at the age of thirteen, and had always been normal. She had three miscarriages and six normal labors. There were five children living. There was nothing abnormal about these labors. Upon examination the woman presented an abdomen which was pendulous, tense, and palpation was very difficult. The uterus was enlarged to about an eight and a half months' pregnancy, and the position of the fetus was central, a vertex presentation. The head, however, was not engaged and the fetal heart was not heard. The distance between the spines was 27 cm., between the crests was 30 cm.; the left external oblique diameter was 23 cm. and the external conjugate was 21 cm. The internal examination showed no abnormality. The labor was expected on January 20, 1912. On December 31, 1911, the membranes ruptured spontaneously; labor pains began five days before. The patient was seen at this time, after the rupture of the membranes, and she then had no labor pains and no dilatation of the cervix. Apparently there was a vertex presentation (R. O. A.). The head was not engaged. An unusually large amount of amniotic fluid was expelled, and the husband stated that the floor was flooded. The patient was not seen again until 2 A. M. January 5, when she had had irregular labor pains for an hour and a half. These, she said, had not been very severe. The cervix was dilated sufficiently to admit one finger. Apparently the vertex was presenting (R. O. A.). The head was not engaged. Her physician, thinking she was in labor in the earliest states, did not remain and advised her to send for him when the pains became more regular and severe. He was called again at 8.45 A. M. the same day. The patient then was in acute shock, with a history of having had a severe labor pain at 8.15 A. M. After that she had no more labor pains. Her night dress was saturated with fresh blood, her abdomen was flaccid, and allowed of easy palpation of the fetus. The fetus was found in a transverse position, with head to the right, and at about the level of the umbilicus; no part presented at the superior strait. It was possible to pass both hands under the fetus and lift it up into the upper abdomen. The patient's pulse was at this time almost imperceptible. On vaginal examination the cervix was made out to admit one finger only and showed that there were two old scars. No presenting part was palpable. An ambulance from Bellevue Hospital was sent for, but the patient died before she could be carried from her bed. An autopsy could not be secured.

In this instance the cause of rupture might have been a weakening or thinning of the lower segment of the uterus, the result of laceration in previous labors. Again, it was possible that the physician might have been dealing with a shoulder or other malpresentation which, with a dry labor, might have been the cause of rupture. This was the third case of spontaneous rupture of the uterus which had occurred in Dr. Brodhead's experi-

ence. Two of them gave a history of very easy normal labors. In one of these there occurred a rupture at the site of the cicatrix which followed a Cesarean section. One of these patients was saved, which gave him a mortality of 66 per cent.

CRURAL PHLEBITIS DURING PREGNANCY.

DR. BRODHEAD reported this case because of the exceeding rarity of this condition occurring during pregnancy. He saw the patient in consultation with Dr. R. L. Irish on January 6, 1912. The patient was a primipara, twenty-three years of age, and had never had occasion to consult a physician prior to her pregnancy. Her last menstruation was in May, about the 12th, 1911, and her confinement was expected about February 19, 1912. Between September 1 and 10, there were vague pains in the left leg, but there was no tenderness or swelling. On December 29, 1911, she had pain and swelling in the left leg and her symptoms had become steadily worse up to the present time, January 6, 1912. Her temperature was 99° F. and the whole leg was found to be very much swollen, the calf and the lower thigh measuring three inches more in circumference than the other leg. There was also some marked tenderness along the internal saphenous vein from the groin down to about the middle of the thigh. Later on there was tenderness in the calf of the leg. The improvement in this case was rapid from this time and the patient was up and about apparently as well as ever. In the last 5000 confinements at the Post-Graduate Hospital there were ten instances of crural phlebitis occurring in postpartum cases, or 1 in 500 labors. Dr. Brodhead's reported case was the first case he had ever seen where a phlebitis had occurred antepartum. Inasmuch as traumatism as a cause could be excluded in this instance it would be interesting to know what form of infection was responsible for the condition.

DISCUSSION.

DR. JOHN O. POLAK asked Dr. Brodhead regarding the blood conditions and the percentage of hemoglobin in the case of crural phlebitis occurring during pregnancy that he reported.

DR. BRODHEAD replied that he was unable to answer Dr. Polak's question.

DR. J. CLIFTON EDGAR said that the subject of spontaneous rupture of the uterus was one of great interest and one that occurred more frequently than was usually supposed. During the past month he had seen such a case at Bellevue Hospital, but the symptoms were not so clearly defined as in Dr. Brodhead's case. Treatment was instituted after she had been in labor for some time and she bled freely. She had been in labor since the day prior to her admission and was in shock. When an examination was made no presenting part could be felt. She was immediately opened and the fetus was found beneath the diaphragm. Previously she had had a tube resected; there

was a rent or tear of the right horn of the uterus where the fetus went through. The patient had been given 1/2 ounce of castor oil; whether this weakened the horn of the uterus was impossible to say. The probabilities were, however, that this was simply a spontaneous rupture of the uterus, and one could not say whether the administration of castor oil had anything to do with it.

DR. W. P. POOL had seen a case of rupture of the uterus in which the cause seemed to be established. The patient was brought to the hospital during the middle of the night and was there treated. Her labor pains began with the child in the occipito-posterior position. She was examined at frequent intervals. The patient had an extremely pendulous abdomen. She complained of much pain and of hemorrhage. The further examination of the patient outside caused the physician to rush her to the hospital.

When Dr. Pool saw her the fetus was outside the uterus an abdominal operation was immediately performed. The placenta was found to be protruding from the uterus. He judged that the rupture had been due to pressure. The uterus had ruptured and the fetus was expelled, and the placenta was protruding.

DR. A. A. HUSSEY reported the case of a woman to whom he was called at 7 o'clock with the report that she was in shock. She had all the symptoms of rupture of the uterus and, therefore, an abdominal operation was at once performed. The uterus had ruptured along the line of an old Cesarean section scar and the fetus had escaped; the membranes were protruding but had not ruptured. He did a hysterectomy and the patient made a good recovery. This was the only case of spontaneous rupture of the uterus that Dr. Hussey had ever seen.

DR. MALCOLM MCLEAN said that the report by Dr. Hussey of a ruptured uterus and protrusion of the membranes intact was very interesting and he had asked members of the Obstetrical Society to make a note of how many such cases they met with. He had seen two such cases.

The condition certainly left a clear field for operation and he hoped the patient would make a good recovery.

DR. J. MILTON MABBOTT stated that on behalf of Dr. Tull and himself he had reported a case of spontaneous rupture of the uterus in his service at the New York Infant Asylum, the rupture occurring at the site of the incision which had been made by Dr. Adrian V. S. Lambert at the Lying-In Hospital in the performance of a previous Cesarean section. The case was not at first diagnosed as one of rupture of the uterus. At operation, however, there was found a rupture of the uterus about 3 or 4 inches in length and with the unruptured membranes protruding.

DR. EDWIN B. CRAGIN spoke of the danger of rupture of the uterus occurring under several different circumstances. In the first place there was the danger of rupture when version was

attempted in a tonic uterus. In the second place, rupture was often associated with attempts to deliver rapidly in a placenta previa. In the third place Dr. Cragin recalled a case upon whom he was performing a second Cesarean section and in whom, on opening the abdomen he found protruding through the separated cicatrix of the former uterine incision the unruptured fetal membranes. In this case he excised the thinned out cicatrix and repeated the classical Cesarean section. Dr. Cragin drew attention to the lesson to be learned from this case: That if a patient presented herself upon whom a previous Cesarean section had been performed and in whom the obstruction to labor still persisted, she should not be allowed to remain long in the second stage, lest there be a yielding of the previous uterine cicatrix.

DR. BRODHEAD stated that what had been said regarding spontaneous rupture of the uterus and membranes intact had taken the wind from his sails. Where there was a ruptured membrane after a twenty-four hours' labor, labor should be assisted by the use of the bag. He always inserted the Champetier de Ribes bag which he believed to be safer for both the mother and the child.

HYDATIDIFORM MOLE, HYSTERECTOMY.

DR. HOWARD C. TAYLOR.—It has seemed to me that in certain cases of hydatidiform mole, an hysterectomy should be the operation of election and I report the following cases to illustrate such a class of cases. The uterus is an organ not essential to the life of the woman but is of value to her during her child bearing period. The real value of the organ is greater to the woman early in her child bearing period who has no children than to the woman who is near the end of this period and who has born her family. As the woman approaches the end of her child bearing period and as the number of her children increase, the less risk she should run to preserve the uterus. The statistics show that nearly 16 per cent. of the cases of hydatidiform mole ultimately become chorioepithelioma and also that there is only a small percentage of cures after the malignant change has taken place. It would seem therefore that after a woman has had the desired number of children and when she is near the menopause that an hysterectomy is the better operation for hydatidiform mole than merely an emptying of the uterus.

The case I would report gives the following history: Mrs. I., an Italian, aged forty-nine years, married for twenty-three years. She had had six children, the first twenty-one years ago and the last four years ago. She had had seven miscarriages, the last five years ago, all between the second and fourth months, and all apparently without infection. She had had no abdominal pain and no backache except with her menstrual periods. She had lost no weight nor strength. Her menstruation for the past seven years had occurred every two to four weeks, lasted for five to six days, and moderate in amount. The last period was ten weeks before

seen by me. Since six weeks before my first examination the patient had been flowing more or less most of the time so that she was markedly anemic. On examination, I found a soft uterus the size of a four or five months' pregnancy. I made the diagnosis of either a soft fibroid tumor of the uterus or an incomplete abortion and sent her to the Roosevelt Hospital for operation. At the operation, the diagnosis of hydatidiform mole was readily made from the contents of the uterus and an immediate abdominal hysterectomy performed. The decision was reached because it was believed that there was less immediate risk in an hysterectomy than in emptying the uterus for hydatidiform mole in a woman in bad condition from previous hemorrhages and because it seemed unwise to subject a woman of forty-nine years of age to the danger of chorioepithelioma. The patient made a smooth recovery and left the hospital on the eighteenth day. The following is the pathological report from Dr. Warren the pathologist to the hospital:

Specimen.—Hydatidiform mole. Uterus and appendages.

The uterus presents the picture of the ordinary pregnant uterus, 12x6x7 cm. in size. The appendages are attached. Weight, 12 1/2 ounces without the mole. The mole weighs 6 1/2 ounces. Pieces of the mole and two sections of the entire uterine wall thickness, one from the placental site, taken for microscopic examination.

The section from the mole shows a large number of vesicles, most of which are covered with two layers of cells—Langhan's and syncitium. A marked proliferation seems to be present in the syncitial layer.

In the wall of the uterus cords of large epithelioid cells have invaded the muscular tissue.

Diagnosis.—Hydatid mole. Early chorioepithelioma.

DISCUSSION.

DR. H. N. VINEBERG agreed with Dr. Taylor in the attitude he had taken in regard to these cases of hydatidiform mole and he had recently read a paper before the Society in which the points made were vividly brought out. When a woman with this condition had passed the reproductive period of her life it was without doubt the safest and best plan to remove her uterus in order to prevent the growth going on to malignancy. Statistics showed that 50 per cent. of the cases of chorioepithelioma were preceded by hydatidiform moles. In a case which he recently had under his care in a woman forty-seven years of age, on finding the uterus the seat of a hydatidiform mole, he extirpated the uterus through the vagina and the patient made a rapid and complete recovery. If she had been a younger woman he would not have done so. He would have emptied the uterus, believing this to be the safest and best way; he would split the cervix and do a vaginal Cesarean section if necessary. He would remove all the contents of the uterus and then watch carefully to see if

anything developed. If the woman should within a reasonable time have hemorrhages he would not hesitate in making a diagnosis of epithelioma. In women during the reproductive period it was his custom to perform a vaginal Cesarean section so as to be able to empty the uterus thoroughly of all the decidua formations and to palpate the interior of the uterus to ascertain if any growth was developing. If there were no evidences of any malignant growth he would try to keep close watch of the patient for some time afterward. In the event of free hemorrhage recurring, he would strongly suspect the development of chorio-epithelioma and would act accordingly.

DR. CLARENCE R. HYDE reported the history of a case that he had seen in which the diagnosis was made of uterine fibroid. The abdomen was opened and a hydatidiform mole found; the uterus was studded with cysts. Because of the advanced degenerative condition of the uterus the question arose as to the advisability of doing a hysterectomy.

DR. ROBERT T. FRANK had inadvertently performed an operation, similar to the one reported by Dr. Taylor, about one and a half years ago. The patient was forty-eight years old, had bled profusely each month and apparently suffered from a large fibroid uterus. On opening the abdomen, the uterus, which was the size of three or four months' pregnancy was found studded with fibroids. A supravaginal hysterectomy was performed. The uterus was found to contain a hydatid mole on which the pathologist reported "hydatid, suspicious of chorioepithelioma."

Dr. Taylor said that he would regularly perform hysterectomy in such cases if the patient had reached a certain age. If the climacterium was nearly reached the problem was much simplified, but women present themselves with this condition who are much younger. The pathologist, in many instances, is unable to give a positive opinion and the final decision rests upon the gynecologist. That 16 per cent. of hydatids eventually become malignant seems an unduly high figure.

To him the more conservative treatment of emptying the uterus and watching for further developments, appeared justified. Then if further symptoms appeared immediate hysterectomy was indicated. This method of procedure would not only preserve many women from unnecessary mutilation but would also prove technically easier as in the interval, the uterus underwent considerable involution.

DR. KNIPE reported a case of

OSTEOMALACIA.*

DISCUSSION.

DR. JOHN O. POLAK reported a case of osteomalacia that he saw about a year and a half ago, in a woman twenty years old. She entered the Jewish Hospital in Brooklyn when she was about

* For original article see page 582.

two months pregnant. The question arose as to what should be done. Her true conjugate was about 4.5 cm. She appeared to have room on each side of the pelvis. The pubic arch was narrow. There was a deformity of one leg, the tibia being bent forward. There was also a deformity of the arm. Dr. Polak suggested to her that she return when she reached term, when a section could be done. The patient, however, did not take that advice. About seven months later he was called to see her in the Williamsburg Hospital when she was in labor. It was interesting to note that in spite of the apparent insurmountable conditions present, a physician had applied forceps several times. The cord was prolapsed and the child was dead. The reason why he was called in consultation and sent her to the hospital was because the physician could not deliver with the forceps after getting them on. A Porro operation was done leaving the ovaries; the patient made an uneventful recovery. Dr. Polak expected to report this case in full at his first opportunity.

DR. HERMANN GRAD reported a case of osteomalacia; he saw this patient about two months ago when she was about eight and a half months pregnant. She has had six children. She had been to two different hospitals where she was treated for rheumatism. There was such a marked deformity of the outlet of the pelvis there was no doubt but that a Cesarean section had to be done. She was admitted to the Woman's Hospital and a Cesarean section was performed and a normal child was delivered. She made an uneventful recovery. This case Dr. Grad said he would report in full later. He removed both ovaries on the recommendation of Isreal. It was interesting to note in this case that after ten days, the extreme pain in the bones ceased, and the patient said that she was much more comfortable.

DR. J. CLIFTON EDGAR reported a case of osteomalacia that he had seen in the '90s and who was in labor at the time. She had been in charge of an Italian midwife. She had had five children, all of whom were living, and all had been spontaneously delivered. His examination showed that she had an absolutely contracted pelvis with a pushing in of the trochanters, a bending of the sacrum, descent of the promontory and beginning trouble with the pubis. The contraction was such that it was with difficulty that even three fingers could be introduced. The patient was very much shortened in stature. She, however, made a good recovery after Cesarean section.

Preliminary to the Meeting Clinics were held at several hospitals.

DR. BOLDT operated at the Post Graduate Hospital.

The first patient was a woman thirty-six years old who had one child at the age of twenty-four years. Since then she has incontinence of urine caused by a vesicovaginal fistula. For the cure of the fistula she was operated upon eight times, five times in Europe and three times in this country; the two last opera-

tions were done by Dr. Boldt. When the woman was seen the first time by Dr. Boldt, the opening in the bladder was so large that the interior of the entire bladder could be inspected, admitting easily three fingers. The uterus was absolutely immobile; the vagina distorted, from the previous operations by scar tissue; and the patient had a very obese and pendulous abdomen, so that an abdominal operation was not desirable. With the first operation done by Dr. Boldt, the fistula was closed so that the subsequent failure revealed an opening not more than about $1/4$ of an inch in diameter. Another operation to close this also proved a failure.

The preliminary step at this time consisted of first making a paravaginal section to make the field of operation more accessible. The technical work, because of the distorted vagina, the immobility of the uterus, the position of the fistula, near the bony structure of the pelvis, was exceptionally difficult. Chromicized cat-gut was used as suture material.

The second patient was a woman with a myoma which had caused profuse hemorrhages for twenty-five years, the woman then being fifty-three years old. The hemoglobin was reduced to 20 per cent. The cervix was bulky and hard, causing reason for suspicion; it was therefore decided to do a total extirpation. The adnexa were found to be suppurative and adherent to the posterior surface of the tumor.

The third patient was also operated upon for a myoma of the uterus; this was a supravaginal hysterectomy, and one adnexum was left because of the youth of the patient, thirty-five years.

The fourth operation was upon a patient who had frequent attacks of pelvic peritonitis, caused by tubal disease from gonorrheal infection. The woman refused to have any operation done which would remove any part of the pelvic organs. A vaginal section was done and both tubes opened. It was thought, before operation, that the distended tubes were filled with pus, but upon operation it was shown that they were hydrosalpinges; they were opened and drained with gauze.

DR. BOLDT, in reporting in regard to the patient he had operated upon for a vesicovaginal fistula, said that the patient was not up yet and would not be allowed to get up until it was thought to be safe. So far as he could see the results of the operation were entirely successful and he would probably allow her to be up in two or three days. The hysterectomy cases were up and about. The second patient he operated upon, doing a supravaginal hysterectomy for fibroid, had some bleeding from the gums; otherwise she had no trouble whatever. The patient, upon whom he had done a vaginal section for adnexal inflammation, went home to-day.

DR. WARD reported that the first case operated upon had so far made an uneventful recovery. In this case he did a curettage trachelorrhaphy and a perineorrhaphy, then a laparotomy for adhesions about both appendages. As both ovaries were pro-

lapsed he did an ante-ligamentous transposition on them, this being the operation for prolapse devised by Manclaire of Paris, and also Borrow's, where a buttonhole is made in the mesosalpinx and the ovaries drawn through to the anterior surface of the broad ligament and fastened there. The appendix which showed an obliterating appendicitis was also removed. The perineorrhaphy performed involved the dissection and exposure of the anterior edges of the levator ani and their suture in the midline.

The second case had made a convalescence of unusual smoothness, considering the amount of trauma necessary in this operation owing to the numerous dense adhesions present. The highest temperature was but $99\frac{1}{2}^{\circ}$ to 100° and the pulse 80 to 90 during the reaction period.

In this case the uterus and appendages were buried in one mass of dense adhesions so that it was impossible to distinguish the fundus of the uterus from the appendages. A supravaginal hysterectomy was done after some considerable difficulty. This patient gave a history of repeated attacks of pelvic peritonitis extending over a period of five years. Undoubtedly the resistance that she had developed in her peritoneum accounted for the very slight disturbance she had following the operation.

DR. HOWARD C. TAYLOR asked Dr. Boldt and Dr. Ward about

THE GIVING OF ETHER OR OTHER ANESTHETICS BY NURSES.

DR. CHARLES GORDEN HAYD said that the nurse who gave the anesthetic at the Post-Graduate Hospital had received instructions from Dr. Rundquist for at least six months before she assumed the responsibility of administering it, and ether was used in all cases. They had now four nurses doing this work, and all trained for it. During the first six months they watched the administration of the anesthetic and attended quizzes conducted by Dr. Rundquist. After six months they were allowed to take cases in order, and at the present time practically all the anesthesia was given by the nurses. These nurses were especially selected from the training school. The work was better done in the work they were doing and not engaged in watching the operator. They watched the patient and not the operation. So far as the routine work in the administration of anesthesia was concerned, the female anesthetist was far ahead of the green interne.

DR. JOHN O. POLAK asked what was the legal status of the nurses who gave anesthesia in the City of New York. Were they on a salary?

DR. WARD, in answer to Dr. Polak's question, said that these nurses who gave anesthesia at the Post-Graduate Hospital were all salaried and they were not permitted to give anesthesia until they were familiar with the stethoscope and its use in determining physical and other pulmonary conditions. They received instruction from competent teachers, taking

the regular classes that were given to the matriculates at the institution in physical diagnosis.

DR. LEROY BROWN asked Dr. Hayd if they were under proper guidance and control.

Dr. HAYD replied that these nurses were placed under the authority of the resident house surgeon. The nurses worked in rotation, the same as did the internes.

DR. HERMAN J. BOLDT said that the most important question that confronted them in the consideration of the giving of anesthetics when placing it in the hands of the nurses was: What was their status legally? What was their status especially in the State of New York? The administration of an anesthetic in this State was a part of the practice of medicine. So far as the ability of the nurses to give anesthesia was concerned, they were superior to junior internes. With regard to their legal status, at the present time, the question was raised whether they had a legal right to employ nurses for the giving of anesthetics. Abroad, especially in Germany, the nurses, or sisters, gave the anesthesia; in this country the nurses were not generally called upon to do this work, but Dr. Boldt did not hesitate to assert that only in a short time in the State of New York, and perhaps in all of our states, when under proper supervision, nurses would be called upon to give anesthesia. They were far more reliable than the junior internes of hospitals.

DR. J. RIDDLE GOFFE said that those who gave anesthesia should be especially equipped for this work. Dr. Ward had referred to those nurses who were especially trained in physical diagnosis, in the use of the stethoscope, etc., but these nurses in efficiency could not compare with the man who had been trained in the medical school of to-day. He believed they were trying to advance the nurses too fast, especially when they are asked to take part in the practice of medicine. At the Woman's Hospital they had a staff of excellent physicians who were well equipped for the purpose of giving anesthesia. They were graduates of the hospital and had fitted themselves by special study for this work. Their remuneration was fifty dollars per month. They alternate with each other in doing the work and by previous arrangement manage their appointments so as to interfere as little as possible with their private practice.

DR. J. MILTON MABBOTT said that as a member of the Comitia Minora of the Medical Society of the County of New York he had become informed regarding the legal status of nurses in the administration of anesthesia. The surgeon was responsible for these nurses. He must take the responsibility on his shoulders, whether the person giving the anesthesia is an interne or a nurse, if such person is not legally qualified to practise medicine, and unless the hospital definitely agrees to relieve him of such responsibility.

DR. LEROY BROWN stated that Dr. Baldy, in his address as President of the American Gynecological Society, some years

past had brought this subject in his characteristic emphatic manner, prominently before the medical profession of America.

Following this address, they had taken the matter up at the Woman's Hospital. To avoid possible friction and also to get the best possible results, they did not adopt the suggestion of training nurses as anesthetists, but appointed young physicians to this position.

The plan, in use at the Woman's, is that a few young physicians are anesthetists, all on a salary. There are no additional perquisites. Two anesthetists are on duty in the morning and two in the afternoon. They are only required to be at the hospital when operations are to be done. In this way, each man has half of the day for his private work and possibly more. The plan has given excellent satisfaction. The anesthesia given is of the highest class and few hospitals I believe, equal it. There are also two alternates who have been previously approved by the Medical Board. When one of the anesthetists wishes to give up his appointment, his position is easily filled by a capable man.

DR. ROBERT L. DICKINSON said that in Pittsburg the office nurse of a surgeon was employed as his hospital anesthetist. She looked after the ether and paid no attention whatever to what the operator was doing. This was an excellent arrangement, for the private patient was met at the hospital by a welcoming face she knew, that of the office nurse. This nurse saw that the doctor who had referred the case was notified, and, that he was, later, kept posted, and she looked out for messages that went to the family. She had an office in the hospital.

DR. EDWIN B. CRAGIN said that at the Sloane Hospital for Women he had adopted a method similar to that in vogue at the Woman's Hospital. He had an anesthetist and an alternate, on a salary, who was allowed to practise outside of the hospital and who gave the anesthesia both to the ward patients and to the private patients in the hospital. Dr. Cragin saw no reason why, if the gentler sex was preferable to the sterner, in the administration of anesthesia, the position of anesthetist should not be offered to one of the young lady graduates in medicine, many of whom he felt sure would be glad to accept the position for the salary paid. It certainly was a distinct comfort at the time of the operation to know that you had as anesthetist one in whom you had reason to have confidence, who was a graduate in medicine and who had had a more thorough training than a nurse.

DR. JOHN O. POLAK said that at the Jewish Hospital in Brooklyn an interne was assigned to the giving of the anesthetic and one trained in the giving of the anesthesia stood by and directed him and, in this way, the interne received a good training. Dr. Polak had no criticism to make of the method employed there. This man was paid a salary and administered or directed

the administration of all anesthetics in the hospital. All private room patients were charged an anesthesia fee. The fee was from \$5.00 to \$15.00. This amount was collected by the hospital and turned over to the anesthetist. What they were doing now in this line was in the experimental stage however.

Dr. RALPH WALDO said that Lebanon Hospital has had four or five official anesthetists appointed from graduated internes of the hospital. The positions have always been eagerly sought. During the first three or four weeks in the hospital the interne is directed regarding the administration of anesthesia by an official anesthetist; after that he is permitted to give the anesthesia himself under general supervision of the anesthetist.

HEMORRHAGE AFTER OPERATIONS FOR CYSTOCELE OR INTERPOSITION.

Dr. GEORGE GRAY WARD said that these cases of hemorrhage following operation were very interesting and he had seen several of them with active bleeding. One case was particularly severe and in two other cases hematoma formed. This one case was in extremis and shock; a cigarette drain was introduced and the results of this appeared to be better than what had been done before. There was no trouble in draining his case.

He had performed this operation of Dr. Goffe for cystocele on a considerable number of cases and the results were certainly very satisfactory. It was astonishing how little shock or pain was occasioned by the rather extensive dissection of the base of the bladder, and the rule was that these patients could void after forty-eight to seventy-two hours without difficulty.

Dr. RALPH WALDO said that he had performed this operation a large number of times and had not seen much hemorrhage during the operation, certainly not from the under surface of the bladder. He had never seen a case of hemorrhage following the operation.

He usually separated the tissues widely at either side of the median incision and very rarely got any urinary symptoms, the convalescence being what he usually got after an ordinary amputation of the cervix. In a large percentage of these cases the patients passed urine without difficulty. Occasionally it is necessary to use a catheter for a few days.

Dr. GOFFE had had some experience in dissecting the bladder from the uterus and the anterior vaginal wall, and had had some cases in which there was much oozing of blood, and occasionally cases which required the application of from two to three ligatures. The dissection he did was a dull one, and whatever oozing there was, stopped as a rule without the use of ligatures. In one or two cases a hematoma formed between the bladder and vagina caused by the excessive oozing. These were easily relieved by removing one or two sutures in the vaginal wall. In cases of excessive oozing it was well to put in a small gauze drain between the bladder and vaginal wall, to be

removed in two or three days. He did not think that anyone should hesitate about doing this work for fear of hemorrhage because the bleeding point could be sought for and tied. The ordinary oozing took care of itself. Very often the use of adrenaline was of aid in controlling the hemorrhage.

DR. BOLDT said that the question of oozing occurred in the experience of all who do such operations. In those cases where there was much oozing he placed into the wound a silkworm strand, which was not removed for from twenty-four to thirty-six hours. This question of oozing he did not think was of serious import, and not as dangerous as some thought it to be.

Dr. Boldt said he would like to hear some criticism about the work that had been seen; the clinics were held for the purpose of learning, and a great deal was learned from criticism of the work done at the clinics.

Dr. PINKHAM said that on Dr. Cleveland's service at the Woman's Hospital, they did quite a number of these operations (which by the way were called the Dürhssen-Mackenrodt) and the results were very satisfactory.

In performing the operation, he was very careful to avoid dissecting too far out on the sides or high up and practically never experienced any severe hemorrhage except in one case. In that case the dissection had penetrated high up on the sides much farther out than the bladder extends and a bleeding took place from tearing a good size artery from the uterine plexus. This necessitated ligation. If the dissection was made close to the uterus in the natural line of cleavage, very little hemorrhage would occur.

DR. HERMANN GRAD referring to instances of bleeding spoke of his experience in Dr. Chamber's service some two years ago. He operated upon an unusually large sized cytocele. A few days later the patient complained of pain and he discovered a hematoma between the posterior wall of the vagina and the rectum. It was rather extensive. This was opened and the clots that had formed were released and the wound healed nicely. The formation of these hematoma was rather, in his experience, unusual. This was the only experience of this kind that he had gone through with. In some cases the bleeding was quite free after suturing but rarely gave any trouble. In this one instance, however, a hematoma had formed between the posterior wall of the vagina and the rectum.

DR. FURNISS reported the following cases:

CASE I.—HAIR PIN IN BLADDER AND RENAL INFECTION.

Girl twenty-two years old, seen first three years ago on account of chronic urethritis. At this time it was learned that she was a masturbator. She also complained of constant pain over the appendix. This was removed with no relief of symptoms. Radiography for stone negative. Distention of the renal pelvis by injection through ureteral catheter produced exacerbation

of the pain. Two years ago her kidney was explored; it was found to be 4 1/2 inches long, with atrophy of the cortex of the upper three-fourths; removed, giving relief of the symptoms complained of.

A year ago this patient went to the City Hospital on account of her chronic urethritis. While there she had several operations on nose and throat, and a laparotomy for tubal disease. Soon after this I heard of her as a patient with marked polyuria (220 ounces a day). From the early part of the summer until August she had retention of urine and had to be catheterized six to eight times daily; about 30 ounces obtained each time; low specific gravity, with no abnormal constituents. We took her in on this account. Functional capacity normal (phenol-sulphophthalein). Through suggestion this retention was relieved. At one time while she was in the hospital she attempted to catheterize herself with a lead pencil from which the lead had been removed; said that she could not wait for the nurse to do it.

Five weeks ago she allowed a friend who wanted to teach herself nursing to attempt catheterization. Said that she had a soft rubber catheter, and that the attempt was painful. The friend told her the next day that she had allowed to slip into the bladder a hair pin that had been used to stiffen the catheter. Saw her three weeks ago and found the hair pin which was just beginning to be incrustated; very little bladder hyperemia. Was not allowed then to remove it.

On February third she called me and stated that the day before she had had pain in the left renal region, and on that morning had had two chills and a fever, with marked tenderness over kidney and some rigidity. Examination the next day showed marked cystitis. Pin removed under anesthesia through Kelly cystoscope, patient in knee breast posture. Since then pain in renal region and temperature have continued. Numerous pus casts found in the urine.

March 7. The patient left the hospital three days after exhibited and was in good condition. The bladder soon cleared up. One week ago another hair pin was discovered. This had been bent so it was four thick. As yet is causing no symptoms. Said that a friend of hers irrigated her bladder and used this to stiffen a limber catheter. We expect to remove this through the Kelly cystoscope in a few days.

CASE II.—DILATED URETERS.

Woman fifty years old. Mother of twelve children. Seen first in April, 1911. Said that for two years she had had great frequency of urination, that urine was cloudy and foul smelling. Knew of nothing that accounted for this condition. For the last three months she has complete incontinence of urine; this necessitating the wearing of a napkin. Had seen a doctor at one of the hospitals, and was told that she had cancer involving the bladder. It was impossible to cystoscope her with one of

the water cystoscopes. With the Kelly, and the patient in the knee chest posture, ulceration of the base of the bladder, with the trigonum completely covered over with phosphatic deposit, was seen. The vertex of the bladder was fairly normal. Under irrigations and applications of silver nitrate to ulcerated area, no improvement was seen. In June, 1911, I had her come in the hospital and made a vesicovaginal fistula. Except for the irritation of the thighs from the discharge of urine she was comfortable. At the end of two months when the bladder condition had cleared up, the ureters were for the first time seen. The left was large enough to admit a lead pencil, and the right somewhat smaller; they stood open when seen through the Kelly tube. The fistula was then closed, union by first intention taking place. The patient now holds her urine for two hours by day, and does not have to get up, nor leak, during the night. She has to have bladder irrigations from time to time, or she is apt to develop a cystitis. Have seen this condition of dilated ureters in four other patients who had had severe cystitis. With the tenesmus in such cases a condition is produced analogous to urethral obstruction, and the dilatation of the ureters is produced by back pressure. The radiograph shows that there is also dilation of the renal pelvis (argyrol injected pelvis).

CASE. III.—FOUR URETERS.

Mrs. D., thirty-four years old. Married. Never pregnant. Symptoms of right hydronephrosis at each menstrual period. When eight years had appendix and right ovary removed.

Menstruation began at sixteen, and was present every twenty-eight days, of three days duration, moderate in amount. When she was eighteen she began to have with and a few days prior to each menstrual period, pain in the right side of the abdomen and in the back; this sometimes associated with nausea and vomiting. Pain can be relieved much by hot water bags to back. Some frequency of urination. Some pus in the urine.

Cystoscopic examination shows mild catarrhal cystitis. Four ureters are seen. Two empty into the bladder in the normal position, and two just about $\frac{3}{8}$ inch proximal to these, and near the outer border of the trigonum. The ones normally situated are normal in appearance; the proximal ones are more rounded.

A catheter inserted into the right normally situated ureter is passed with some difficulty. Distention of the renal pelvis caused the pain of which she complains.

All four ureters were catheterized. Aside from a few epithelial cells and an occasional leukocyte, nothing abnormal was found in any of the urines.

On the left side a catheter was placed in the two ureters. The proximal one was first injected with 50 per cent. argyrol and the kidney radiographed. The two were injected and another radiograph made. The two show that the two ureters are distinct and have distinct renal pelvises. The ureter opening proximally

runs to the top of the kidney. The other two ureters could not be injected at the same time as the argyrol so clouded the distending medium that it would have been impossible to see in the bladder.

Within the last eighteen months we have seen four cases of three ureters; this is the first of four.

Pain at the menstrual period referred to the kidney has been described by a number of authors, and we have met it four times.

CASE IV.—PAPILLOMA OF THE BLADDER.

Mrs. B., fifty-one years old. Never pregnant. Had a pan-hysterectomy at forty-three for fibroids. In good health until two years ago when she began to have blood in the urine so profuse as to be readily recognized. Was treated with iron by her family doctor, this iron to supply the blood lost, for a considerable length of time. The hemorrhage has been almost continuous; exertion had slight effect. Seldom clotted. Cystoscopy showed a broad base papilloma situated over the site of the right ureter. This has been sparked three times within the past three weeks, the last treatment a week ago. After the last treatment the hemorrhage stopped. She has a cystitis localized on the inferior half of the distended bladder. On the right side back of the ureter is seen a diverticulum. Now the growth can be seen well. The superficial part has become necrotic and sloughed away. The base and the edges will require more treatment.

CASE V.—SYMPTOMLESS RIGHT RENAL HEMATURIA.

Mrs. S. Never pregnant. Always as far as she knew in good health until the onset of present trouble, which began Christmas week, 1911. Then she noticed that the urine was of a port wine color. This has continued until the present time with little if any variation. There has been no pain anywhere and there has been no disturbance of urination. Patient has not lost any in strength. Has slight headache at times.

Examination shows blood pressure 140 mm. Hg., no evidence of renal mobility or tumor. Examination for stone by the x-ray negative. No tubercle bacilli.

Cystoscopic examination shows bright red blood coming from the right ureter. The urine from the left is clear, contains a few hyaline and finely granular casts and a small amount of albumen. Indigo-carmin injected intramuscularly appears in the urine from the two sides in fourteen minutes.

In view of the above findings a diagnosis of renal hematuria from chronic nephritis was made.

History subsequent to the time of exhibition. Feb. 9, Dr. Ward explored the right kidney, which was not enlarged, or abnormal in shape. It showed no evidence of tuberculosis, growth, abscess or stone. The capsule was four or five times as thick as normal, and very adherent to the friable kidney. Decapsulation. Since then the hemorrhage is as before.

In the way of treatment stypticin by hypo, ammonium and iron sulphate gr. viiss every four hours. Following this, which was of no use, blood serum (obtained from husband and friends), 1 ounce under skin every day for six days was tried; this for the reason that Welch had success in cases of hemorrhage of the new-born, and Willy Meyer had used it with good results in jaundice cases before operation. This also produced no change.

March 5. Adrenalin chloride, 1-1000, 3 drams were injected into renal pelvis; this had no effect on the bleeding.

DISCUSSION.

In the discussion Dr. FURNISS replied as follows to a question of Dr. Grad.

In regard to the case of papilloma. Much of the growth had sloughed away as a result of the fulguration. Because of this sloughing there was a cystitis. The remaining part of the papilloma would be fulgurated after the slough had come away, and the outlines of the part left could be well determined. This patient's bladder hemorrhage had cleared up, and she was gaining weight.

In regard to the hematuria case. She had the kidney explored, and a decapsulation done. The capsule was four or five times as thick as normal and very adherent, portions of the very friable kidney coming with it. Kidney not enlarged; there was no evidence of tubercle or new growth. Since the operation the hemorrhage has been the same as before. In some of these cases of chronic nephritis the hemorrhage clears up after a week or more; in others it persists. Last January he had a similar case of two weeks duration in which the hemorrhage ceased five days after decapsulation. Two others have cleared up after decapsulation. He stated that chronic nephritis was the most usual cause of symptomless renal hematuria, and that as a rule the hemorrhage was unilateral.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

*Meeting of January 25, 1912, FRANKLIN A. DORMAN, M. D.,
in the Chair.*

DR. ROBERT T. FRANK reported

TWO CASES OF SECONDARY ABDOMINAL PREGNANCY.

Primary abdominal pregnancy occurs so rarely that, until quite recently, its actual occurrence has not been satisfactorily proved. In order to demonstrate a primary peritoneal insertion of the ovum it must be shown, beyond a doubt, that neither the

ovary or tube have been involved. The two cases which I report to-night are primarily tubal, and secondarily underwent further development within the peritoneal cavity.

Ectopic Gestation, Probably Arising from the Fimbria Ovarica, with Beginning Lithopedian Formation.—The patient, Mrs. L. L.,

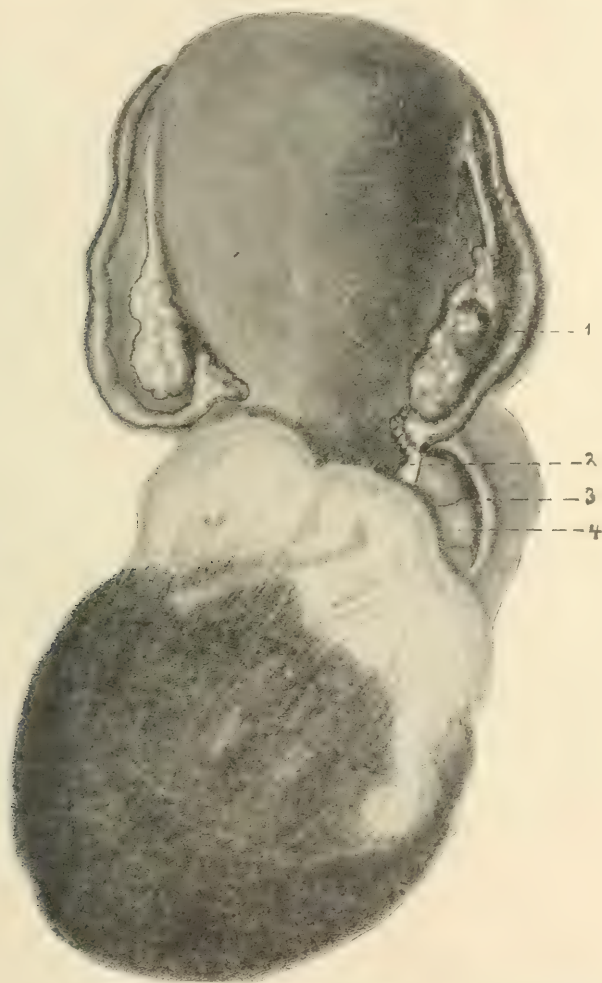


FIG. 1.—Case I. Conditions as found at operation. 1, Corpus luteum; 2, elongated fimbria ovarica; 3, right sacro-uterine ligament; 4, rectum.

age thirty-one years, was referred to me by Dr. B. Lefkovich with the diagnosis of "ectopic, probably abdominal, pregnancy with dead fetus." Her history was as follows: Menstruation regular and normal. Married ten years. One child nine years ago, no abortions.

Eight months ago, one week after her regular period, she had a severe attack of abdominal cramps in the right iliac region. The pain lasted two and one-half hours. Two days later she fainted. She suffered three more attacks of pain respectively ten, thirteen, and eighteen days after the first seizure. For four months the patient did not menstruate. She considered herself pregnant as she had nausea, enlargement of the abdomen



FIG. 2.—Skiagraph of specimen in Case I, showing complete skeleton of fetus closely attached to the placenta.

and of the breasts. For the last four months menstruation has been regular, four weekly, but scant. During the last two months there has been considerable secretion from the breasts.

Examination revealed a uterus which reached almost to the umbilicus, and behind it a hard, slightly irregular mass which could barely be palpated from above. Bimanual examination showed that the uterus was enlarged, anteverted and elevated by a hard, semicartilaginous mass which occupied Douglas' culdesac and reached laterally almost to the anterior superior spines. The mass was only slightly movable. There was no

discoloration of the vaginal mucosa; no increased pulsation of the vessels. The patient was admitted to the first Gynecological Service of Mt. Sinai Hospital. X-ray examination merely showed a shadow in the pelvis.

On July 17, 1911, I opened the abdomen and found a somewhat enlarged uterus with a few small fibroid nodules on its posterior surface. There was a small quantity of gelatinous exudate among the coils of intestine which lay in the false pelvis. Behind the uterus and extending into the lowest portion of the Douglas was a hard irregular mass the size of a large orange. The mass was attached to the uterus, sigmoid and pelvic parieties by fine velamentous adhesions. Before proceeding further the ovaries and tubes were now carefully inspected and found absolutely normal, and without adhesions. The right fimbria ovarica, however, was unusually long and broad forming a band 2 cm. wide which was lost in the mass. The tumor was freed, without difficulty, from the adjacent structures, and then liberated by tying its pedicle—the right fimbria ovarica. There was a large corpus luteum in the right ovary. Convalescence was uneventful.

The specimen consisted of a black discoid mass upon which was stretched a mummified fetus, still within its membranes. Microscopical examination showed that the black portion consisted of placenta. X-ray demonstrated a complete fetal skeleton. The fetus corresponded to the fourth month of gestation.

The history conclusively shows that in the first month of gestation some disturbance took place, probable gradual extrusion of an ampullary ovum which, however, continued to derive its blood supply from the fimbria ovarica. Growth, expansion and gravity served to cause elongation of the fimbria and descent of the mass into the Douglas pouch. At the fourth month the fetus died and gradual mummification was well under way when interrupted by the operation.

The second case was

A Ruptured Tubo-abdominal Pregnancy with the Insertion of the Placenta on the Posterior Surface of the Broad Ligament and Pelvic Floor.—The patient was sent into Mt. Sinai Hospital on July 17 by Dr. Nettie Schapiro for ruptured tubal pregnancy and admitted to the first Gynecological Service on the same day as the previous patient. Her history was as follows:

Mrs. I. G., aged thirty-five years; married eleven years; four children, the last one four years ago; no abortions. Menstrual history regular, the last menses had occurred four months previously. She believed herself pregnant. Two weeks, ten days and again four hours before admission she suffered from severe pain in the right iliac fossa. The last attack was the worst, and was followed by syncope and collapse.

On admission the patient was in severe collapse, pulse 148, temperature 101.6°, respiration 32. The abdomen was distended; there was a bulging semifluid mass felt in the posterior

fornix and the various signs of pregnancy were noted. Hemoglobin was 68 per cent.

Operation was performed at once. The abdomen contained a great quantity of free blood. A live four months' fetus lay free among the coils of intestine. The uterus corresponded in size to a three months' pregnancy. The outer third of the



FIG. 3.—Case II. Conditions as found at operation. The placenta is attached to the posterior surface of the right broad ligament and the peritoneum over the division of the aorta. The outer portion of the right tube is wanting. Adhesions and blood clots have not been represented.

right tube was lacking, and a large placenta was located, attached to the posterior surface of the right broad ligament, the peritoneum covering the division of the aorta and slightly downward on the peritoneum of Douglas' culdesac. On careful attempt to free the placenta the right broad ligament tore completely away from its attachments and the torn ovarian vessels retracted upward.

They had to be ligated without previous exposure of the ureter, because of the desperate condition of the patient. Right salpingo oophorectomy was performed, and as violent oozing continued from the bed of the placenta, tamponing became necessary. The posterior fornix was perforated from above and a gauze drain covering the raw bleeding area led out into the vagina. Toilet of the pelvis and closure of the abdominal incision completed the operation which lasted forty minutes.

The patient whose hemoglobin was found to be 37 per cent. next day, slowly rallied and showed general improvement. Her bowels moved upon the third day. However, vomiting of bile stained fluid developed, although the bowels continued to move two or three times daily in response to enemata, and the general condition was excellent. On the ninth day her condition suddenly changed. The stomach continually filled up with bilious fluid, and complete obstruction supervened. As a last resort the abdomen was reopened. Omental adhesions were numerous, there was no peritonitis. The upper jejunum was found much distended, the rest of the intestine collapsed. A kink was located high in the left renal region, produced by a large adherent blood clot which had angulated the intestine. The angulation was relieved and a tube enterostomy established. The patient, however, did not rally and died five hours later.

The specimens obtained at operation were a normal fetus 25 cm. long with a cord 12 1/2 cm. in length. The placenta was thin, circular, 10 cm. in diameter. The ovary was normal, the outer one-third of the tube was lacking; in the torn end, villi were demonstrated.

Some important points, necessary to make an exact anatomical diagnosis, are lacking in this case. The exact relation of the ampullary end of the tube, which evidently formed part of the fetal container could not be determined. It was possible to demonstrate, however, that the placenta was directly attached to the parietal peritoneum in the location described above. I feel justified, therefore, to record the case as one of tubo-abdominal pregnancy.

Dr. SAMUEL M. BRICKNER reported a case of

MULTIPLE FIBROIDS COMPLICATING PREGNANCY. HYSTERECTOMY,
RECOVERY.

M. B., twenty-six years, was seen by me in consultation with her physician, Dr. Citron, on Sept. 8, 1911. Admitted to Mount Sinai Hospital on Sept. 9.

Past history negative. First menses at thirteen, regular, four weekly, three to four days. No pain. Last regular period fifteen weeks ago. Married six months.

One week after marriage, patient had attack of increased frequency of urination and pain on urination. No discharge. This lasted but a short time.

Present illness began four weeks ago. Patient felt perfectly

well excepting for one day two months ago when she had short sharp pain in left side of abdomen. Thinks she felt hard mass in that region. Patient dates illness back but four weeks. At that time she had an attack of severe general abdominal cramps and nausea. No fainting, no collapse, no spotting. Cramps lasted three days when she felt relieved and for the first time noticed a small amount of bloody discharge which continued for thirty-six hours. There was no fainting or collapse. Four days later the patient had another attack of severe abdominal cramps which was general over the entire abdomen. At this time there was no fainting or spotting. Since this time the patient has had irregular attacks of abdominal colic but never vomited until the day before admission. For the past week, the cramps have become more frequent and the patient complains of urinary frequency with burning during the act. She also has slight pain during defecation.

The physical examination shows the abdomen to be irregularly and asymetrically enlarged. On the left side there is a hard smooth mass, freely movable and extending from the pelvis to three fingers' breadth above the umbilicus. On the right side a number of nodules can be felt under the skin which resemble fetal small parts. A bruit can be heard over the right side. The vaginal examination showed the vulva and vagina to be normal excepting for the congestion due to pregnancy. The cervix lies behind the symphysis. The entire culdesac is filled by a mass which can be felt to the left side of the uterus. It is a question whether the posterior cervical wall is filled by the mass or whether it fills the culdesac of Douglas. The mass moves with the cervix and is soft in consistency.

The rectal examination shows that the mass bulges into the rectum and fills the culdesac.

Operation.—A 5-inch suprapubic incision was made and the peritoneum opened. It was immediately apparent that we were dealing with a mass of multiple fibroids. The uterus was irregularly enlarged and the entire mass delivered. The large tumor felt in the culdesac before operation was a huge fibroid partly subperitoneal and in part interstitial. There were numerous other growths mostly interstitial. Labor at term would have been impossible without Cesarean section, so, in spite of the fact that this was the patient's first pregnancy and that she was so young, it was decided that hysterectomy was the safest procedure to pursue. The usual technic was employed. The right tube and ovary and the left tube were removed. Convalescence uneventful.

The specimen showed multiple fibroid nodules varying in size from an apple to a cocoanut. The measurements were: From above downward, 19 cm.; anteroposteriorly, 22 cm.; side to side, 13 cm. Two of the neoplasms were *nistitial* and the largest of these was deeply wedged into and blocked the pelvis.

SECONDARY ABDOMINAL PREGNANCY; OPERATION; RECOVERY.

Mrs. J., seen on Nov. 27 in consultation with her physician, thirty-six years of age, married ten years, one child eight years ago. First menses at eleven, always regular, five days duration, four weekly type. Last menses Sept. 29, 1911—ten days overdue. Since this time, patient has been spotting continuously with

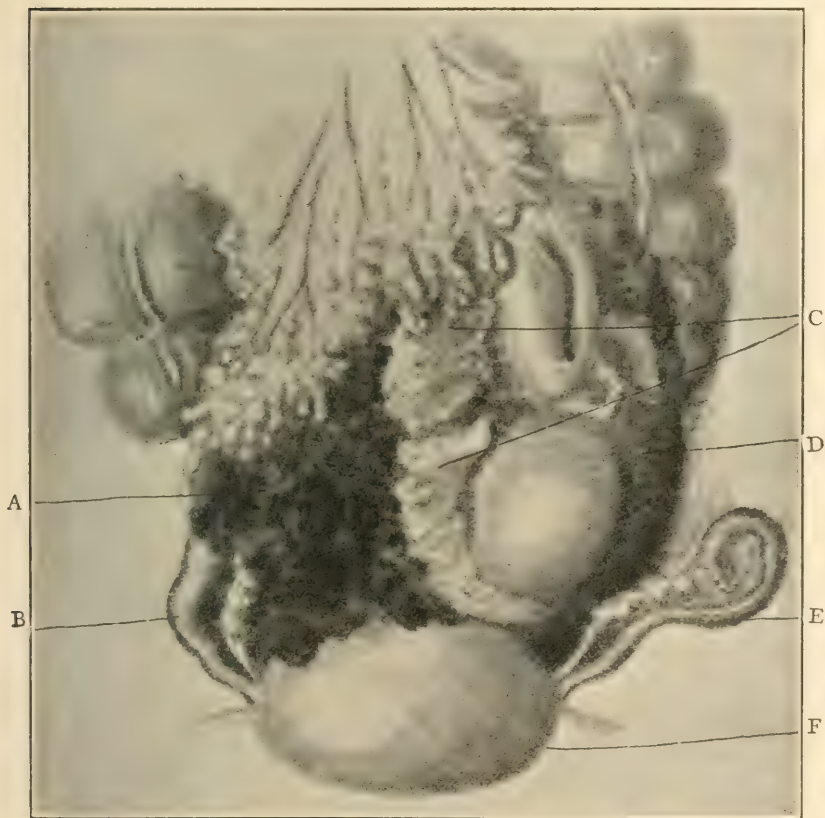


FIG. 1.—Secondary abdominal pregnancy. A, Blood clot; B, right tube; C, placenta; D, gestation sac; E, left tube; F, uterus.

occasional profuse flow. There have been frequent attacks of abdominal pain accompanied by nausea, thirst and perspiration. There has been no fainting, but the patient has felt very weak. Three weeks ago there was an attack of sudden sharp pain in the abdomen followed by extreme prostration. The patient thought herself pregnant.

Examination.—The abdomen was exceedingly rigid and sensitive to touch, but there was no one place more sensitive than another. On bimanual examination a mass could be made out

to the right and above the uterus extending to the umbilicus. The mass was irregular in shape and exceedingly tender. The uterus could not be made out. The patient was exceedingly pallid. Her temperature was 101, pulse 130. Hemoglobin, 28 per cent., white cells, 21,600, polynuclears, 84 per cent.

Diagnosis.—Extrauterine pregnancy, with hematocele; or secondary abdominal pregnancy.

The patient was removed to Mount Sinai Hospital and operated upon the following day. An abdominal incision was made about 5 inches long. The pelvis was filled with clots and old fluid blood. To the left lay a large mass partially covered with intestines and omentum which formed the superior portion of what was seen to be a sac. The left border of the sac was the sigmoid flexure, the posterior wall of the uterus formed its inferior wall and its right border was composed of blood clot in which the right tube was lost. At the left border of the clot and below the omentum lay the placenta (see figure). The sac was removed *en masse*. The patient's condition did not permit of any further procedure. The abdomen was closed by layer sutures.

Specimen.—The mass consisted of a gestation sac made up of a sac containing a fetus of about three months' extrauterine development and which contained amniotic fluid. The umbilical cord was attached to an irregularly shaped placenta distant about 3 cm. from the amniotic sac. The fetus was alive at the time of its removal but the heart stopped beating within a few moments.

The convalescence was uneventful after the first few days.

This is a case of secondary abdominal pregnancy originally a primary pregnancy in the right tube. The course of the development of the ovum was not interrupted by its extrusion from the tube.

The drawing of the specimen was kindly made for me by Dr. R. T. Frank.

DR. C. FREDERIC JELLINGHAUS reported

A CASE OF TRUE LIGAMENTOUS UNRUPTURED TUBAL PREGNANCY OF EIGHT MONTHS.

The patient, age twenty-two, married four and a half years, gave birth spontaneously to a full-term macerated fetus three and a half years previously. For five weeks after this delivery she was compelled to remain in bed with irregular temperatures and left-sided abdominal pain. The latter continued and she was treated for a salpingoophoritis. The last regular period occurred on January 12, 1911. Summarizing the remaining history of the case, the following facts were found worthy of note: The last regular menstruation took place on January 12, 1911, eight months before the woman ceased to feel life. A so-called abortion took place on Feb. 23, 1911, which was six and a half months before life was no longer felt. Following this there was a pelvic condition present which was diagnosed as an exudate

and treated accordingly in a hospital. An examination made on September 30 showed the presence of an abdominal tumor extending 30 cm. above the symphysis and at this time the patient also ceased to feel life. A diagnosis was made of eight months intrauterine pregnancy with probably a dead fetus and an attempt made to induce labor. Examination under an anesthetic disclosed that this diagnosis was a mistaken one and that an unruptured tubal pregnancy of about eight months was present. A laparotomy was done and the fruit sac, together with the placenta and membranes were removed with considerable difficulty.

Five days after operation, vaginal and abdominal fistulæ appeared and on the tenth day a urinary fistula developed in the same location. At the end of the third week, although fecal and urinary discharges per vaginam ceased, they continued through the abdominal opening. By the end of the seventh week the abdominal fistulæ closed but for some time previously urine was passed with the stools per rectum. A diagnosis of spontaneous uretero sigmoidal fistula was made and as the patient was up and about and in good general condition no further radical operation was considered at the time. Some time later the patient developed symptoms which pointed to a possible infection of the kidney, but this soon subsided. When seen sixteen weeks after operation, the patient stated that she felt well and had no further symptoms referable to the left kidney. The watery stools were still present but it was only necessary for the patient to get up occasionally at night in order to evacuate her bowels. The production of the fistulæ was due to the fact that the fruit sac was retroperitoneal and the sigmoid portion of the descending colon was displaced upward so as to cover the same. The mesentery of the latter was interpreted as an adhesion to the transverse colon and injured during the removal of the abdominal mass. The fistular formation was likewise favored by the gauze drainage which was packed against the ureter and interfered with its proper blood supply.

DR. JAMES W. MARKOE reported

A CASE OF INTERSTITIAL PREGNANCY.

A woman, thirty-one years of age, was recently operated upon in the Lying-in Hospital. The personal and family history were negative. Menstruation began at fourteen and had always been regular, the periods lasting five days and being without pain. There was no history of serious illness or venereal disease.

Five years ago the patient was admitted to the hospital for what was believed to be an incomplete abortion. A curetage was done but no fetus discovered. After remaining in the wards for some time she left against advice but returned in a few days in a condition of marked collapse with rapid pulse and high fever. At the time a diagnosis of ruptured ectopic gestation was made and it was believed that this had become

infected as the result of some latent tubal disease. At the time of admission the patient's condition was so bad that it was not deemed advisable to operate. The patient gradually improved under conservative treatment but it was several months before she was sufficiently recovered to leave the hospital. Nothing further was heard of the case until September 28, 1911, when the woman again applied to the institution for treatment. She stated that three years ago she was delivered with instruments of a very large child at term which was still-born. At the time of her recent admission the temperature and pulse were normal, likewise the blood count. The urine showed a faint trace of albumin, with acetone and diacetic acid present, but no casts. The vaginal examination disclosed a slightly bloody discharge containing some pus. There was an old tear on the left side of the cervix and a first degree laceration of the perineum. A bimanual examination showed a tumor about the size of a goose egg on the right side of the uterus and apparently connected with it. This mass was extremely tender and slightly movable. According to the patient's statement her last menstruation had taken place on July 10, 1911, so that a provisional diagnosis of ectopic gestation was made and preparations were begun the following day for an operation. Ether was given by the open mask method to the surgical degree. A median incision about 10 cm. long was carried from the symphysis upward. On opening the abdomen, the tumor became immediately apparent and was seen to be directly connected with the right horn of the uterus. The left tube and ovary were congested and bound down with old and very firm adhesions both to the intestines and to the omentum. After breaking up some of these adhesions the swollen and congested Fallopian tube, together with the left ovary, were removed. The appendix, which was also included in the mass of adhesions was then freed and removed by the purse-string method. The uterus with its tumor was thus rendered somewhat more accessible and its removal by a partial hysterectomy was easily accomplished. It was deemed advisable not to remove the entire uterus because of the possibility that old inflammatory foci on the left side would be opened up.

The subsequent history of the patient was uneventful, there was scarcely any rise of temperature or increase of the pulse rate and the wound healed by primary union. On the nineteenth day the patient was allowed up and about.

In reviewing this case it would seem that the patient's illness five years previously was probably a ruptured ectopic pregnancy on the left side in which the hemorrhage was not very marked and where the products of conception were eventually absorbed leaving behind the dense adhesions which were found at the last operation. The fact that during the interval an intrauterine pregnancy had occurred, was of interest and showed that the conditions which prevailed to bring about the two ectopic

gestations did not prevent the ovum from lodging in the normal mucous membrane of the uterine cavity.

The interstitial variety of ectopic pregnancy seemed to be the least frequent form met with and up to 1904 a review of the literature on this subject by Wirth which appeared in Winckel's "Handbuch," showed a total of about thirty cases published up to that time. Since then an increasing number of cases had been reported probably owing to the fact that greater attention had been paid to the diagnosis of this condition. As the pregnancy developed practically in the walls of the uterus, it might proceed to a more advanced date than in the case of the tubal varieties of ectopic gestation. For this reason a rupture of the sac was more likely to prove fatal than with the other type. It was possible where rupture had not taken place that an abortion might result either into the tube and beyond or into the uterine cavity where the growth might continue, but from the histories of the cases thus far published, it was quite obvious that if an interstitial pregnancy was recognized an operation was necessary without delay. Unfortunately, however, it was less easy to make such a diagnosis than in the presence of a tubal gestation, but it had been claimed that the history of cases of interstitial pregnancy the amenorrhea was usually persistent, while in the tubal pregnancy more or less irregular bleeding occurred. It was also important to determine in each case whether an excision of the sac was possible or whether hysterectomy was necessary. In the case just reported it was deemed advisable to leave a part of the uterus because of the surrounding conditions and the subsequent history of the case showed that the decision was a favorable one.

DISCUSSION.

DR. H. N. VINEBURG was much interested in the case reported by Dr. Markoe. A few years ago he had a case of interstitial pregnancy with symptoms of an indefinite nature, pointing chiefly to obstinate constipation and general peritonitis. The patient was first admitted to the medical service, but the house physician, who had just been transferred from the gynecological ward, made the diagnosis of ruptured ectopic pregnancy and notified Dr. Vineberg. On examination he found a very large uterus with no definite mass in the pelvis, and while he agreed that the condition was probably due to a bursting of the products of conception, he could not convince himself that it was an ordinary case of ruptured tubal pregnancy. He assumed that there was a rupture of the uterus from some unknown cause. On opening the abdomen he found it filled with blood, liquor amnii, debris, and a fetus, of about four months, lying free among the intestines. The uterus looked as if it had its entire fundus blown off. It was removed, as was also, the foreign matter in the abdominal cavity and the abdomen closed, with a gauze drain leading into the vagina. The patient made a good recovery.

Dr. Vineberg said that recently he had a patient with a small projection on the anterior wall of the fundus of the uterus median to the round ligament insertion, which appeared like a small sac. This was removed and submitted for examination. Some pathologists stated that it was a pregnancy, and some others said it was not. It was not a cyst, but a cystic mass containing blood, and about the size of a walnut.

These were the only instances of interstitial pregnancy he recalled of having seen out of over 200 ectopic tubal pregnancies.

DR. RALPH WALDO reported

A CASE OF FIBROID COMPLICATING A PREGNANCY AT THE FOURTH MONTH.

A primipara, twenty-six years of age, last menstruated September 7, 1911. The time that elapsed between her last menstrual period and the operation was eleven weeks and three days, but probably the pregnancy was not over ten or eleven weeks. The woman had been married only a few months. Her urine was normal. She was sent to her family physician because of abdominal pain and he detected a tumor in her pelvis. Shortly after this Dr. Waldo saw her and operated. He presented the specimen removed which was a fibroid that had been situated back of the uterus and filled the pelvis and pressed on the rectum. The entire colon, especially the cecum, contained a large amount of solid matter. This patient had been constipated for a long time; she had taken various kinds of cathartics. Dr. Waldo showed the uterus with the fetus contained therein. An incision had been made in the cervix at one side of the cervical canal. He left one ovary in. The only thing that could have been done in this case was to take the uterus out. The patient made an uneventful recovery

DISCUSSION.

DR. HERMAN J. BOLDT believed that the specimens presented were the most interesting of any that had been shown in the Section for some time.

With regard to Dr. Frank's cases of primary abdominal pregnancy, he did not believe that such a condition had yet been proven, although many had been described. Some years ago Dr. Boldt had a case that he thought was unique and the specimen was sent to Dr. Welch, of Baltimore, for confirmation of his diagnosis. After repeated and careful examinations he reported back that it was not a case of primary abdominal pregnancy. On the placenta were two or three fimbriæ from the Fallopian tube. So far as urinary fistulæ, were concerned, some of his cases were cured spontaneously. With regard to fecal fistulæ, they usually healed spontaneously. That was his experience, in all but two instances. The difficulty of making a diagnosis in abdominal pregnancies at present was not so great as formerly. The first case of abdominal pregnancy that had been his privilege to see

occurred in 1879. There were present at that time, Drs. Goldthwaite, Pallen, Polk and Boldt. The diagnosis made was intra-uterine pregnancy, and Dr. Boldt's chief, the late Dr. Pallen, proposed doing a Cesarean section. The fetus lived a short time. In abdominal pregnancies the diagnosis was not so easy as might be supposed.

DR. VINEBERG stated that at the International Medical Association in Budapest in 1909, Dr. Schauta asserted that in 100,000 cases of pregnancy in his clinic, there had been only seventy cases complicated with fibroid growths, in other words, only seven in every 10,000 cases of pregnancy. Here to-night, we had have two cases presented to us, and just now in the second Gynecological Service at Mt. Sinai there were two cases and he, himself, had a case within the past couple of months, to be presented at the next meeting of the Section. It would seem, therefore, that the complication is more frequent here than in Vienna. The note that ran through the discussion at Budapest was one of extreme conservatism and it was this which guided him in his practice. Still every now and then cases occurred, in which surgery was imperative, as demonstrated in the cases presented to-night.

Dr. Vineberg complimented Dr. Jellinghaus upon the full and accurate description of his case of abdominal pregnancy at full term. He himself had a similar case some years ago, which had not been recognized in a metropolitan hospital and the patient was discharged, as suffering from an inoperable malignant growth. Dr. Vineberg was able, with the aid of the patient's history and the local findings, to make a probable diagnosis. He operated upon the case in Mt. Sinai Hospital, although the technic was extremely difficult, the placenta being very large and universally adherent to the intestines, abdominal wall, and the right pelvic wall. He was so fortunate as to remove all the placenta, excepting the membrane, without any casualty and the patient made a good recovery, without any complications.

Regarding the healing of ureteral fistula, his experience did not tally with that of Dr. Boldt. He had seen some cases, in which the fistula apparently healed, as the leakage permanently ceased and the patients were free from any urinary symptoms afterward.

DR. G. STURMDORF.—Notwithstanding the energetic propaganda of the last ten years, the cases presented to-night make it very evident that we have much to learn in the diagnosis and management of extrauterine pregnancy.

There is no biologic reason why abdominal pregnancy should not occur more frequently. In every pregnancy it is simply a question of osmotic sustenance of the ovum in the earliest stages and vascularized nourishment in the later stages.

The peritoneum suffices for both, yet primary abdominal pregnancy, as such, has not been authentically established, if we exclude pictorial evidence.

The cases on record have all proven to be early tubal pregnancies, extruded into the abdominal cavity.

If we recall the contention of those, who two years ago, advocated the conservative treatment of ectopic pregnancy, the question naturally forces itself upon us,—how many cases among the nonoperated will result in abdominal pregnancy with ultimate findings on the operating table, such as have been detailed this evening?

The very possibility of such sinister complications should make the strongest plea for prompt intervention and early interpretation of symptoms pointing to the existence of extra-uterine pregnancy.

DR. A. ERNEST GALLANT referred to a patient whom he presented to this Section some five years ago, from whose abdominal cavity he had removed a full term, dead child, eleven months after conception. For some days after operation urine escaped from the vagina, later from the bowel as loose watery stools. After some months the stools became normal, and all the urine escaped via naturale.

DR. ARTHUR STEIN said that what most interested him in these cases of myomata complicating pregnancy was the mode of operation; whether enucleation, supravaginal amputation or total extirpation. A short while ago he had a very interesting case of this kind where it was hard to decide (even after the abdomen was opened) whether the enucleation of the myomata should be resorted to or the supravaginal amputation of the pregnant organ. The latter operation was performed. There were present two myomata, each of the size of a fist on either lateral wall of the uterus which was pregnant in its third month. Right after the supravaginal amputation the uterus made a few contractions and the ovum was half way expelled from the uterine cavity. Dr. Stein did the supravaginal amputation mainly out of fear of subsequent rupture of the uterus in case he had enucleated the myomata. However, in Dr. Waldo's case the mode of operation was a clear one from the very first start. One always must individualize in these cases. My patient was a primipara, twenty-six years of age, and Dr. Stein's made an uneventful recovery.

DR. ROBERT T. FRANK agreed with Dr. Boldt that most of the cases reported as primary abdominal pregnancies were really secondarily implanted on the peritoneum. All the cases reported to-night were unquestionably of the latter type. The three most authentic cases in the literature were those of Gallabin, Witthauer and Hirst. Unless discovered very early it would be impossible to distinguish between a primary and a secondary implantation. Gallabin's case did not rupture until the tenth week. Witthauer's case in which a six weeks' ovum was found attached to the omentum might have been a fimbrial pregnancy torn from its primary site by retraction of the omentum. Hirst's case, however, seems unquestionably primary. Here a minute

ovum was found embedded in the posterior layer of the broad ligament and the ovum plus the surrounding parts were widely excised and submitted to careful examination. No aberrant tubal or ovarian elements were found, and no disturbance of the ovular site had taken place. This case appeared to prove the possibility of primary abdominal implantation beyond doubt.

Dr. Jellinghaus' case could not be used as an argument against the expectant treatment of ectopic gestation. The cases in which operation might safely be delayed were those of pelvic hematocele or tubal abortion in which the process of *growth has come to a standstill*. In the case under discussion, had the diagnosis of extrauterine pregnancy been made, the patient would unquestionably have been operated upon early; but the condition was not recognized. This error was largely due to the unusual rigidity of the abdominal wall which persisted even under deep anesthesia. Dr. Jellinghaus was to be congratulated on the fortunate outcome, as the operation presented unusual technical difficulties.

DR. S. M. BRICKNER said he had operated upon his patient because the tumor was evident, and was thought probably to be a dermoid cyst complicating pregnancy. The tumor was also rapidly increasing in size.

With regard to Dr. Jellinghaus' case, Dr. Brickner did not see the patient in May, but Dr. Frank saw her in August when she appeared at the dispensary and he suspected an abdominal pregnancy. She was taken into the hospital and the examination convinced him that he was dealing with an intrauterine pregnancy with a breech presentation. Here the mistake was made.

Five years ago Dr. Brickner suggested that cases of tubal abortion did not always require operation. Until, however, we reached methods, of diagnosis, more refined than those that existed at present, the same principles regarding operation would be continued as they had been following in the past and, therefore, they would operate upon all cases of extrauterine pregnancy except large hematoceles. Assuming that they were dealing with a case of tubal abortion, the abdomen would be opened, the diseased tube removed, as well as the contained hematoma. Dr. Brickner asked what under these conditions was going to prevent the ovum from growing if it was alive at the time and was lying in the mass of blood clots in the pelvis.

DR. RALPH WALDO said regarding fibroids which complicated pregnancy, that it seemed to him there were many who believed to all practical purposes that it was a malignant disease which required operation, but Dr. Waldo did not take this view at all. Even if the pelvis was closed by a fibroid he would permit the woman to go to term if she would without interference; no interference should be made unless the uterus attempted to empty itself. He knew of two instances where the Porro operation had been performed and with two living children.

DR. HENRY DAWSON FURNISS reported

A CASE OF PAPILLOMA OF THE BLADDER TREATED BY
FULGURATION. DEMONSTRATION OF METHOD
AND APPARATUS.

A woman, seventy-two years of age for two years had had intermittent hemorrhages from her bladder. Kelly's cystoscope was employed to determine the nature of her trouble which was found to be papillomata of the bladder; they were four in number, all on the left side of the bladder and in the line of the ureter. Dr. Furniss demonstrated the apparatus used. The examination was made and treatment given with the patient in the knee-chest posture. After the third fulguration the urine was clear of blood for two days; then she began to bleed again. The hemorrhage was quite profuse. A suprapubic cystoscopy was performed and as he was unable to empty the bladder of blood clots, he was much interested to find the papillomata had sloughed out and the bleeding came from the largest one; which caused a sloughing of about one-eighth of an inch of the bladder wall. The patient was drained suprapubically. An hypostatic pneumonia developed and he feared that she was going to die because of it. Dr. Furniss gave a demonstration of the apparatus used.

DR. H. J. BOLDT, showed three specimens.

1. UTERUS AND SUPPURATIVE ADNEXA, REMOVED BY PAN-
HYSTERECTOMY.

The interest of the specimen presented centers in the history, of the symptoms, compared with the pathological condition found at the time of operation, the specimen as such not showing anything unusual. There were present diffuse adhesions which firmly bound the pelvic organs to the surrounding pelvic walls and to the intestines. The patient is forty-nine years old, and the pyosalpinges surely must have been present a long time—probably a number of years—yet the complaint of pain in the lower abdomen and back, dates back but three months.

The specimen is an excellent illustration to prove that tubal inflammation may exist without causing marked inconvenience to the patient. It also demonstrates that pain, if present, is not a characteristic pain of any particular pathological condition.

2. MYOMATOUS UTERUS REMOVED BY PANHYSTERECTOMY,
BECAUSE OF ATYPICAL BLEEDING, DESPITE A PREVIOUS
BILATERAL SALPINGO-OOPHORECTOMY.

The woman, forty years old, had been operated upon elsewhere, but only the tubes and ovaries had been removed. In addition to the bleeding, there was pain of a griping character in the lower abdomen. The previous operation had left the woman with a suppurating abdominal fistula in the line of the abdominal incision.

When the abdomen was opened, the reason why the previous operator had not completed the operation, and was content to remove only the adnexa, was readily understood; the technical difficulties, because of adhesions, were almost unsurmountable. This is another verification of the fallacious idea that formerly existed in the minds of the profession, that for a bleeding myoma, castration sufficed to stop the bleeding. It also shows that small tumors may cause intense suffering; as was the case in this instance.

3. OVARIAN CYST WITH TWISTED PEDICLE AND HEMORRHAGE INTO THE CYST, COMPLICATING PREGNANCY.

The patient, thirty-four years old, had a child two and one-half years ago. She is again pregnant four months. Six days previously she was seized with cramp-like pain in the left lower abdomen, which has not entirely ceased. She asserts that since the beginning of her pregnancy she had three such attacks, but the previous ones soon disappeared. The examination, soon after the beginning of the pain, is said to have shown the presence of a small tumor, about the size of an ordinary hen's egg. When the woman was examined by Dr. Boldt, the tumor had markedly increased in size, the abdomen was sensitive upon touch, and it was evident that a local peritonitis was present, shown subsequently upon operation, by the presence of intestinal and omental adhesions.

The diagnosis of an ovarian cyst with a twisted pedicle and hemorrhage into the cyst, was based upon the sudden occurrence of the pain, and its character, the rapid increase in the size of the tumor, the intraperitoneal position of the tumor and its close relation to the uterus.

Upon operation the diagnosis was verified. There were two twists of the pedicle.

ANTEFLEXIO-VERSIO UTERI A CAUSE OF FUNCTIONAL DISORDERS OF THE BLADDER, AND A METHOD FOR ITS CORRECTION.

DR. ARTHUR STEIN read this paper. He said that while the nature of changes which until recently had been grouped under the term "irritable bladder" had been recognized and treated accordingly, there remained a small group of disturbances which required further discussion. In an article entitled "Functional Disorders of the Bladder in the Female, Simulating Cystitis" the writer had briefly surveyed the various functional disturbances of the bladder in women which did not originate in the bladder itself, but might be caused by affections of the pelvic connective tissue, by tumors, or by disturbances of the general system outside the pelvis. He had also made mention of the fact that retroflexion and anteflexio-versio of the uterus might cause bladder manifestations which completely resembled those occurring in typical cystitis. Since the publication of that article he had directed his attention to this latter class.

The literature contained only quite isolated reference to the subject. It was clear that the number of disturbances of the bladder which directly depended upon an exaggerated anteversion of the uterus was very few. The writer had shown in his article referred to that in about 33 per cent. of all gynecological affections women complained of bladder disturbances of the most variegated kinds and it was equally clear that only a small fraction of this 33 per cent. was caused by anteversion. However, he thought it time to call the attention of the gynecologists to a treatment that had given satisfaction in his hands although he had but a few cases to report. The treatment outlined was only used in such functional disorders of the bladder as were dependent upon uncomplicated, pronounced anteflexio-versio. If one considered that a highly anteflexed and anteverted uterus with its fundus overlapping anteriorly, permanently pressed upon the neck of the bladder and the upper part of the urethra, it was perfectly intelligible that at the point of contact there must be permanent mechanical pressure, the consequence of which would be a permanent irritation with all its sequelæ. The logical treatment was of course the removal of this irritation, but before attempting this it was necessary to exclude an affection of the bladder itself or any pathological changes of the kidneys by cystoscopic examination and chemical analysis of the urine. The idea suggested itself whether it would be possible to dislodge the uterus from an exaggerated anteflexio-versio and to retain it in the corrected position. This he had succeeded in doing in the four cases which he described. He succeeded in bringing the uterus into its normal position and holding it there by means of a pessary by quite similar manipulations to those employed in the correction of a retroflexed uterus, except that the movements were reversed. The pessary was inserted as in retroflexion, but reversed so that the cross bar of the pessary was lodged in the anterior vaginal vault and the concave aspect of the ring was toward the promontory. This method had nothing to do with the one that was generally known as anteversion therapy, nor with the so-called anteflexion pessaries of the old school of gynecologists. As to the shape of the pessary he could hardly give any definite directions. He had adapted the ring to existing conditions and shaped it accordingly. In three cases he had used Hodge's ring and in the fourth case he constructed the ring by simply doubling up a hard rubber ring. In three of the cases cystoscopic examination and urinary analysis was negative.

Case I.—Mrs. S., forty-seven years of age, seen for the first time on October 1, 1910. Her principle complaint was that for three years there had been considerable vesical tenesmus and frequent urination. She had had bladder irrigations and the neck of the bladder had been cauterized with silver nitrate, but without success. The uterus was somewhat larger than a goose egg, was hard, freely movable, and rested directly upon the neck of

the bladder in the most pronounced anteflexio-versio. Examination of the bladder and urine were negative. The trigonum and orificium internum urethræ were slightly hyperemic. The position of the uterus was so pronounced that the author conceived the idea of trying its reposition and fixation by the insertion of a ring in the anterior vaginal vault, refraining from any bladder irrigations whatever. In this case the doubled up hard rubber ring was inserted into the anterior vault after the uterus was shifted away from the bladder and toward the promontory. After a few days the patient returned stating that the bladder disturbance was considerably less intense. Although success in this case was not absolute owing to the long duration of the trouble and the extreme nervousness of the patient, a very marked improvement took place. She was able to sleep undisturbed for several nights during the week and could retain her urine during the day for two, three or even four hours. Encouraged by this relative success the writer watched for a better opportunity to test the method.

Case II.—Mrs. L., twenty-six years of age, presented herself on September 15, 1911. She had been married for sixteen months and had suffered from pressure to urinate for four or five years. She had to leave her bed six or eight times each night and strangury occurred every half hour during the day. She had been treated with nitrate of silver without success. Examination showed the vagina narrow, and the orificium externum urethræ normal. The uterus was movable, somewhat enlarged, hard and rested closely upon the posterior bladder wall and urethra in acute angular anteflexio-versio. Parametria and right adnexa were normal but the left were rather thick. The urine and bladder were normal, but there was slight hyperemia of the neck of the bladder. The uterus was dislodged posteriorly by the insertion of a Hodge pessary in reverse position into the anterior vaginal vault. After two days the patient returned to report that she only had to urinate twice during the previous night as against many times nightly during the past few years. Five days later she seemed to be perfectly restored, saying she had been able to sleep one night without interruption and had urinated only three or four times during the day. On October 10 she reported that the bladder irritation had entirely disappeared and that she felt like a new person since the treatment was begun. The ring had since been changed once a month. The other cases were similar to this one and were followed by the same success.

It was perfectly clear that this method was totally different from those mentioned by Fritsch and Dudley. Dudley referred to the insertion of a Hodge or Smith pessary into the vaginal vault in order to effect an elevation of the uterus and Gritsch referred to the method of inserting a hard rubber ring into the posterior vaginal vault. It should be emphasized again that the method outlined here consisted in inserting a Hodge pessary or

one especially shaped to meet existing conditions, into the *anterior* vaginal vault in an exactly reverse way to the method practised in retroflexion. The object was to get the uterus away from the bladder and to maintain its correct position in the pelvis. This method was for cases of vesical irritation caused by the displacement of the uterus and not for the treatment of anteversion itself.

DISCUSSION.

DR. H. N. VINEBERG for years had been interested in these cases of bladder disturbances occurring in women and he was particularly interested in the paper just read by Dr. Stein. The reader of the paper makes an error, if he thinks he was the first to use the Hodge pessary in the reverse position for the relief of these cases. Such an employment of the pessary had been in vogue years ago and was discarded as it became more customary to make use of the cystoscope in women, to ascertain the cause of frequency of micturition, so common a symptom in gynecological practice. In some cases the existence of a pathological anteversion might cause bladder disturbances, but it could not act in that way if it was dependent upon an inflammatory condition at the base of the broad ligaments, or in Douglas culdesac, drawing the cervix backward and with it the neck of the bladder. Dr. Vineberg did not think that any flexion of the body of the uterus upon the cervix would compress the neck of the bladder, and if it could, it ought to give rise to retention and not to incontinence. The situation of the neck of the bladder at the junction of the cervix with the body, was such that it would not be possible for the body of the uterus to press upon it no matter how great the degree of anteversion. The relief that the doctor gave with his support could, no doubt, be explained by the pressure of the bar of the pessary upon the neck of the bladder, or upon the urethra adjacent to it, as in many of these cases there was a weakening of the sphincter, or a dilatation of the urethra, for the normal urethra serves as an aid to the control of the vesical sphincter. This is well illustrated in cases where the urethra has had to be amputated on account of malignant disease, and if the amputation be carried close to the vesical sphincter, incontinence follows. For several years Dr. Vineberg investigated these cases of frequent micturition in women with the Kelly cystoscope, and he found that in the vast majority of the cases, there was more or less hyperemia and erosion of the trigonum. These slight changes are not recognizable by the Nitsche cystoscope or any of its modifications, and, hence, have doubtless escaped Dr. Stein's observation. Dr. Vineberg found he could readily cure these cases by the direct application of solution of nitrate of silver (10 per cent. to 20 per cent.), to the affected areas in the trigonum, with the patient in the knee-chest position. The customary method of employing

nitrate of silver solution to the neck of the bladder by irrigation or instillation, as a rule is valueless, as there is always some residual urine in the bladder, which mixes with the inserted solution converting it into chloride of silver and thus rendering it inert.

DR. HENRY DAWSON FURNISS believed that mal-position of the uterus had little to do with those bladder disturbances. If these cases were examined it would be found that there was inflammation of the trigone or else in the urethra itself. If in the urethra the trouble would usually be in the proximal one-half, there more often than in the bladder portion. The use of the cystoscope seemed to have something to do with the relief of these cases. The massage of the urethra by the passage of the instrument produced good effects as well as the action of the boric acid solution which was used.

DR. A. ERNEST GALLANT said that some fifteen years ago he first inserted the pessary "end for end," and very soon determined that the broad end curving upward behind the symphysis, lifted the trigone upward, did not compress the urethra, and elevated the whole uterus by supporting the cervix well back in the pelvis. In most of these cases there is coincident inflammation of the trigone which must be treated by direct medication to its irritated surface.

DR. HERMAN J. BOLDT did not know what Dr. Stein meant by replacing the uterus in cases of antelexio-versio. In these cases they all knew that as soon as the fingers were taken off, the uterus returned to the same position previously occupied. When he speaks of the bending around a rubber ring, that simply makes the method employed by a Gehrung pessary, which is always used in our clinic. The irritation of the bladder is caused by the anteversion or the antelexio-versio. The latter position of the uterus, is the physiological position. The pessary itself never places the uterus in "proper" position but simply raises the uterus.

There was no doubt but that vibration applied to the neck of the bladder gave relief in a large number of the cases if there was no pathological condition present in the urethra or the neck of the bladder. Overdistention of the bladder in many instances would be productive of good as well. The treatment to which Dr. Stein had called attention, was of early date. The use of the Hodge or Smith pessary did not relieve the condition any better than did the Gehrung pessary, but Dr. Boldt believed that the latter held up the uterus better.

DR. MAX ROSENTHAL said that in his experience about 75 per cent. of all the patients seen in the gynecological service of public dispensaries complained of frequent micturition. It is impossible to generalize in regard to treatment of such cases. Many cases complicated with antelexion were improved or cured, as to their frequency of micturition, by simple routine treatment, tampons, douches, etc. On the other hand, cases with some organic bladder

trouble required treatment, directed to the bladder condition itself, without regard to the existing antelexion.

DR. ARTHUR STEIN, closing the discussion, believed that the mere lifting of the neck of the bladder had a great deal to do with the relief of the vesical disturbance in these cases. In regard to Dr. Furniss's remarks, two of his patients had been cystoscoped repeatedly by other physicians and without any relief whatever from this procedure.

REVIEWS.

DELAYED AND COMPLICATED LABOR. By ROBERT JARDINE, M. D., Edin.; M. R. C. S., Eng.; F. R. F. P. & S., Glas.; F. R. S., Edin. Octavo of 351 pages. With one hundred and seven illustrations and three colored plates. Price, \$3.00. New York, William Wood & Co., 1912.

Dr. Jardine's book is to be accepted as a record of his personal experiences largely obtained in the well-known Glasgow Maternity Hospital during an active service of over eighteen years and must not therefore be regarded merely as a compilation. The contents of this book afford a very satisfactory résumé of the subject and the author's attitude in most cases is a conservative one, although some of his views may not be accepted as in accord with American practice, *e.g.*, his advocacy of symphysiotomy in some persistent occiput posterior positions. There are certain features brought out by the author which may be referred to somewhat more in detail. The so-called retraction ring of the uterus is accorded timely attention. The author firmly believes in its existence and regards this condition as a frequent cause of obstruction in labor, a view contrary to that generally held, in which this phenomenon is claimed to be the result rather than the cause of dystocia. Dr. Jardine draws a careful distinction between retraction and contraction of the uterus, limiting the former term to the permanent shortening and thickening of the muscular fibers of the uterus during active labor, which process is a progressive one and often permanent. The ledge or ring which forms at the junction between the lower and upper uterine segments during labor, otherwise known as Bandl's ring, is not usually given the attention which it deserves as a factor in complicating labor and in fact its very existence is denied by some. The author of the book shows that it may form either in front of the presenting head or behind it around the neck, and is so impressed by the importance of this condition that he even advises abdominal Cesarean section in case the child cannot readily be delivered by the normal channels. The description and treatment of other obstetrical conditions is characterized by simplicity and with few exceptions the author's recommenda-

tions are in thorough accord with obstetrical teaching of the present day. It is rather a relief to find that Jardine favors a more conservative treatment in eclampsia than most text-book writers advocate, especially as regards immediate and quick delivery, for he believes and probably with good reason, that undue haste in emptying the uterus should not be displayed. He even goes so far as to say that the uterine contents should not be interfered with, unless the convulsions steadily increase in either frequency or severity. In this statement Dr. Jardine does not seem to take into account, however, the fact that convulsions may be entirely absent in cases that sometimes terminate fatally. He believes that abdominal Cesarean section is entirely uncalled for in the treatment of eclampsia unless there is some other reason for doing the operation and claims that the vaginal section is much safer. In view of the difficulties attending the latter operation, which the author himself admits in another chapter, this restriction is scarcely tenable. The statement that the prognosis of eclampsia is gravest in cases occurring during pregnancy and less so in those after delivery, is not entirely in accord with the observations of others, in this country at least. The use of the term "eclampsia" to the exclusion of later and better appellations, is also to be questioned, and the term "toxemia of pregnancy" although more general and appropriate, is not made use of. In the chapter on induction of labor, Jardine refers to the good results he has always obtained with gum elastic bougies, a procedure which will probably be questioned by other clinicians, who have found their use in this connection attended with some danger, particularly as regards injuries to the placenta or membranes. In the discussion on forceps operations, the recommendation to apply these instruments with the patient in the left lateral position will hardly meet with general acceptance in this country, as this attitude does not afford a satisfactory control over the patient, such as would be obtained with the woman in the lithotomy position. However, as it is the usual custom in England to deliver a woman in labor on her side, we ought not to question the author's preferences in this connection. The indications for doing abdominal Cesarean operation advocated in this book seem rather limited, considering the good results which have been obtained by others in a more extended field. Jardine advises the high incision in both the abdomen and the uterus, and opens the latter through the middle of a pessary of special form, which he claims makes the incision almost bloodless. His description of the operation as given seems to include a great deal of manipulation of the uterus by the operator and assistants, which in view of the simplicity of other methods employed at the present day, is entirely unnecessary and inadvisable. His advice to move the bowels in forty-eight hours after operation by calomel and salts is also questionable, likewise the requirement that the patient be kept in bed for at least four weeks after the operation. There are many other

features in the book, however, which are in thorough accord with more modern teaching and give to the book a character which recommends it as a clear and concise exposition of the rather broad field of operative obstetrics.

A MANUAL OF MIDWIFERY FOR STUDENTS AND PRACTITIONERS.—By G. BALFOUR MARSHALL, M. D., C. M., F. R. R. P. S. G. Senior Gynecologist, Royal Infirmary, Glasgow. Extra-Academical Lecturer on Midwifery and Gynecology, Glasgow. With 9 colored plates and 125 illustrations in the text. Glasgow, James Maclehose & Sons, 1912.

Dr. Marshall's book affords an excellent and concise review of the essential features and facts of obstetrics and constitutes a very satisfactory manual for students. The book has been developed from the lecture notes which Dr. Marshall issues to his students and covers the ground included in a course of 100 lectures. As this is primarily a text-book, the author very wisely limits his subject matter to facts of every day importance met with in general practice and avoids confusion by omitting controversial arguments and quotations from authorities. The treatment of the various obstetrical conditions is that most generally adopted by the profession, but one notices statements and omissions here and there that will probably be corrected in future editions. Among other things it was noted in the section on the treatment of eclampsia that the use of nitroglycerin is not mentioned and that *viratrum viride* is favored. The routine employment of saline infusions in this condition may also be questioned, but aside from this and a few other statements, which may be regarded in the light of differences of opinion, the book is a very worthy one. Attention must be directed to the very simple but very effective means used for illustrating the book by the employment of numerous outline diagrams with brief explanatory legends. This is a very satisfactory departure from the elaborate photographic, but often otherwise unsatisfactory methods employed in similar works.

A HANDBOOK OF OBSTETRIC NURSING for Nurses, Students and Mothers. Comprising the course of instruction in obstetric nursing given to the pupils of the Training School for Nurses connected with the Woman's Hospital of Philadelphia. By ANNA M. FULLERTON, M. D. Formerly Obstetrician, Gynecologist, and Surgeon to the Woman's Hospital of Philadelphia; Late Lecturer on Surgery and Operative Midwifery in the North India School of Medicine for Women. Small octavo of 272 pages. Seventh revised edition. Illustrated. Philadelphia: P. Blakiston's Son & Company, 1911. \$1.00 net.

Of such a well-known little book as this it is hardly necessary to more than announce the appearance of a seventh edition. The work of revision has been carefully and happily done by Catherine McFarlane. None of the lucid simplicity of style which gave the

charm to the former editions has been lost. New chapters have been added on "the examination during pregnancy" and on "obstetric operations," and the sections on eclampsia, ophthalmia neonatorum, and the care of premature infants have been rewritten. Under the care of the new-born infant, the modified milk formulæ used in the maternity of the Woman's Hospital of Philadelphia have been substituted for certain formulæ of the former edition, and the directions for dressing the cord have been conformed to present usage. Twenty-one of the illustrations are new.

FURTHER RESEARCHES INTO INDUCED CELL REPRODUCTION AND CANCER. Consisting of papers by H. C. ROSS, M. R. C. S., England, L. R. C. P., London; J. W. CROPPER, M. B., M. Sc., Liverpool; and E. H. ROSS M. R. C. S., England, L. R. C. P., London. 63 pages. With illustrations. The McFadden Researches. P. Blakiston's Son & Company, 1012 Walnut Street, Philadelphia, 1911. \$1.00 net.

These papers outline a continuation of the results of the researches which were published by H. C. Ross about a year ago in a book entitled "Induced Cell Reproduction and Cancer." The book described a method by which it was found that human white blood-corpuscles and other cells can be made to divide when they are absorbing certain chemical agents from a film of jelly set on a microscope slide. The chemical agents evidently cause the divisions; and this fact formed the basis of a theory as to the possible causation of benign and malignant growths within the body, and led to the elaboration of experiments to try to prove the theory in question. The book was compiled in rather an unusual manner, and the results which it mentioned were revolutionary to the older ideas, but it described a new method of reasearch which has undoubtedly revealed new facts. Just what the meaning of these facts might be has been questioned and the author's deductions criticised. He answers the criticisms and then goes on to say:

"As the line of experimentation which we are employing differs from those adopted by other workers in cancer research, it may be valuable to explain this difference and to summarize briefly the main principles underlying the solution of the problem. It has already been pointed out that cancer consists essentially of a growth composed of cells which are reproducing themselves too rapidly. In the malignant tissue the balance between cell-reproduction and cell-death is not maintained, the proliferation being excessive. In order to find the cause of the disease, therefore, researches must be directed towards finding the exciting cause of this excessive cell reproduction. Unfortunately, the immediate cause of normal—apart from excessive or abnormal—cell-division has heretofore not been known, and hence, before one can attack the cancer problem, it would appear that the exact cause of normal cell proliferation must be elucidated.

"It may be said that there are two main theories regarding the cause of cancer, both of which appear to involve the idea that *normal* cell-division is an inherent vital function of the cell. All living matter is capable of reproducing itself, a fact which is so obvious that it appears to be taken for granted that reproduction is an intrinsic function of living matter, similar, for instance, to that of the assimilation of water or the power of movement; in other words, that there is no actual exciting cause which normally makes a living cell reproduce itself, but that the living protoplasm will continue to multiply automatically, so to speak, as long as it is alive.

"With regard to *malignant* proliferation, however, one of the theories suggests that cancer is due to a perversion of this normal function owing to some unknown change occurring in the intrinsic characteristics of the cell itself; the cell no longer reproduces itself in a normal manner, but suddenly becomes excessively prolific, and produces offspring which also multiply very rapidly, exhibiting the well known appearances of "cancer cells." The other theory leads one to believe that the abnormal cell-division is caused by the presence in the neighborhood of the cells of a living parasite introduced into the body from without. It appears that many investigators of the first theory consider it inadvisable to make a frontal attack, because they do not hope to solve the nature of a vital function of protoplasm, but are trying to find out what will influence the growth of masses of cells or tumors by transplanting them through various animal under varying conditions, especially with a view to the discovery of what will prevent their growth. Work based on the second theory has for its object the endeavor to isolate the parasite, to produce experimentally a malignant growth with it, and then to find some method of preventing and curing its action.

"Apart from many speculations, in addition to these two main theories, there are, of course, several others; notably one suggesting that the parasite is an ultramicroscopic one, another that it is intracellular, and, lastly, there are those which indicate that cancer cells are normal ones which have reverted to the "reproductive type," or, again, are inclusions of undeveloped or fetal tissues. Few of the theories, however, seem to attack the problem of the cause of normal and malignant cell-division directly. The explanation of how a parasite, even if it be ultramicroscopic or intracellular, can cause a living animal cell to reproduce itself too rapidly is not forthcoming. On the other hand, it has been suggested that cell-division is due to a combination of physical and chemical factors which so far have not been specified; and, again, there is the theory that all cells have the function of reproducing themselves automatically unless they are restrained by a chemical "anti" substance, although how the latter acts is not yet explained.

"The line of work which we have adopted differs from the above in that we believe that normal cell-reproduction is not

merely an intrinsic vital function or duty on the part of the cell, but is directly caused by chemical agents; we consider that before a cell can divide it must absorb a definite quantity of specific chemical substances. As already mentioned, we arrived at this conclusion because we found that certain human cells, which hitherto had never been seen to divide, could be made to undergo division figures on a microscope slide in response to chemical agents; a discovery which will be found fully described, together with the methods employed, in the book above referred to. In one of the following papers the chemical agents are specified and further investigated; and, judging by the way in which these substances are set free in the body, we maintain that the death of cells as caused by injury, for instance, gives rise to the reproduction of their living neighbors, for the exciting agents are set free by the death of protoplasm. If this be correct, we have also evidence to show that malignant proliferation may be brought about by the addition to the normal agents of other exciting substances, the combination of which causes abnormal or excessive cell-multiplication, and which can be produced in an injured site by the action of organisms. As already mentioned, our work has reached the stage at which it must be determined whether the figures which we can induce in the cells, and which we interpret as division figures, are really the phenomenon of cell-division or not; an interpretation which involves a point revolutionary to commonly accepted cytological teaching.

"I do not wish to imply that we originated the idea that cell-reproduction is affected by chemical agents, because certain substances were described as influencing the development of the eggs of certain fishes long before we induced human cell-division. But the work with human cells and the isolation of the actual chemicals is new, as well as the deduction from this work that normal cell-division is brought about by cell-death."

The included papers describe the chemical substances which cause the cell-division of human lymphocytes; the methods of making permanent fixed films; and the methods by which cell-division can be induced in human lymphocytes.

THE PRINCIPLES OF GYNECOLOGY. By W. BLAIR BELL, B. S., M. D., London. Assistant Gynecological Surgeon, Royal Infirmary, Liverpool. Octavo, 551 pages. With 6 colored plates and 357 illustrations in the text. Longmans, Green, and Co., New York, 1910.

In this work Dr. Bell has achieved a distinct success. Departing somewhat widely from what he considers "time-worn and too long honored" methods he has adopted a simple and logical arrangement of his subject and presents to the general profession and the student, in a most interesting form a complete and lucid survey of the principles on which modern gynecology is established.

In his preface he states—what a reading of the book confirms—"I have been continually impressed with the great difficulty of

dealing in a cohesive and at the same time coherent manner with a subject of so many ramifications, and which is so riddled with inherited inaccuracies. I have endeavored to avoid the latter, but I am well aware that I, too, may have perpetuated unwillingly and in ignorance what others will hold up to ridicule. While attempting to be as complete as possible in a limited space, I have laid stress on those conditions which are most likely to cause the general practitioner difficulty in his daily work, and I have gauged these by my own difficulties in the past.

"The consideration of operative procedures, which naturally fall more especially to the gynecologist, is confined to brief *résumé* of the essential principles and details of the chief methods employed in uncomplicated cases. The preparation of the patient and the after treatment, with which everyone should be familiar, have been dealt with at greater length. Likewise I have tried to meet the needs of the student by dealing somewhat fully with the scientific side of the subject. Of the morbid histology, which plays such an important part in gynecological diagnosis, there will be found many photo-micrographic illustrations, without which no pathological description is adequate. For the sake of convenience in the study of these, and in order to avoid repetition and not to overburden the text, I have thought it advisable to append a detailed description of each.

"The appendix of classified causes of certain common symptoms is intended for the student to revise his knowledge, and to afford the practitioner some assistance in making a diagnosis by the process of exclusion.

"It is necessary to add that I have purposely avoided as much as possible the use of proper names; and somewhat diffidently I have omitted all references, in the belief that they are not required by those for whom this book is intended. Further, in order to keep within a reasonable compass, I have for the most part expressed my own views and the results of my own work and experience, and have avoided adducing a series of comparative suggestions and opinions which are liable to place the student in the position of Buridan's famous quadruped. I have preferred to put before the reader the data, and to indicate the lines of treatment as they appear to me to follow common sense and modern knowledge."

The illustrations are very well chosen and well executed, and are notable for the preponderance, as already expressed, of histology. The printing, presswork and binding are good.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Isthmico-cervical Pregnancy.—Louis Devraigne (*L'Obstét.*, Nov., 1911) believes that many abortions may be due to isthmico-cervical implantation of the ovum. The implantation in this location is not as firm as when in a normal situation, and a severe hemorrhage declares the beginning of the separation of the ovum from a location where muscular contraction is not sufficient to close the bleeding vessels. The author gives in detail two cases in which the development was entirely in the cervix, the fundus of the uterus taking no part in the pregnancy, but forming a sort of sac aside from the developmental sac. The author has also found recorded and has studied sixteen cases, none of them so typical as these two. Most of these patients were multiparæ who had already had a number of children, with large uteri, fatigued by many pregnancies, and a mucosa affected by endometritis. When the ovum is situated on the anterior wall of the cervix it is more easily detached, while on the posterior wall it may remount into the uterus. The diagnosis is not easy and the first warning of the condition is a severe hemorrhage. The walls of the cervix have become softened and vascularized by the contact with the ovum and are enormously thickened. The chorionic villi sink themselves into the muscular layer of the uterus. These hemorrhages may take place at the time of the monthly period, with a fetid, profuse discharge of blood. In one reported case the woman died of hemorrhage after three quarters of an hour. The cervix has lost contractility entirely, and feels abnormally thickened below the isthmus. Infarcts in the placenta have been noted. Labor may be spontaneous, but adherence of the placenta is frequent, and the remains are difficult to remove. Many subjects die without being delivered, and hemorrhage may continue after delivery even with a hard and well contracted uterus. The prognosis for the child is bad, labor taking place before it is viable. For the mother it is also bad. If death from hemorrhage is escaped infection is easy in this abnormal condition of the cervical tissue. Labor must be as rapid as possible, and if after tamponing bleeding does not stop the uterus may have to be removed.

Pernicious Anemia in Pregnancy.—Bourret (*Bull. de la Soc. d'obst. de Paris*, November, 1911) gives the histories of three fatal cases of pernicious anemia observed by him, in which blood examinations were systematically made. In these cases the anemia became most intense after the end of the first half of pregnancy. This affection did not develop in patients in

miserable circumstances, with lack of food and bad hygiene, as might have been expected; nor did frequent pregnancy have anything to do with it. In these cases the presence of albumin in the urine was not marked nor were there lesions in the kidneys at autopsy. The blood showed less than one million red corpuscles, few eosinophiles and few neutrophile leukocytes. The author found that the delivery of the fetus was not effective in saving the life of the mother. Interruption of pregnancy appears not to be indicated.

Menstruation during Pregnancy and Lactation.—A. Grosse (*Journ. de. méd. de Paris*, Nov. 12, 1911) thinks that there is no warrant for the current belief that menstruation may occur during pregnancy. The position of the ovum and the development of the placenta in the uterus will effectually close the uterine cavity and make menstruation impossible. Study of the flowing that occurs during pregnancy shows that it resembles menstruation neither in regularity nor in consistency. It is rather a hemorrhage arising from a low implantation of the ovum, a detachment of the placenta, or endometritis. It often occurs about the time of the periodic congestion and so is mistaken for menstruation. There must be a pathological condition of the membranes present. Menstruation during lactation does not occur normally, but if it takes place it does not necessarily change the quality or the quantity of milk furnished by a healthy mother.

Difficulties in the Diagnosis of Pregnancy During the First Three Months.—Paul Bar (*Bull. méd.*, Dec. 9, 1911) gives little weight to the functional signs of pregnancy, such as nausea, vomiting, etc. The first important sign of pregnancy is amenorrhea; next come changes in the shape of the uterus; it becomes rounded, enlarged, and softened. This softening is not like any other. Bar and Daunay have sought a test for pregnancy in the nature of an organic reaction, using placental extract. The reaction is never present in the nonpregnant woman; in early pregnancy it is not always present; hence it is of little diagnostic value. Amenorrhea leads to vaginal examination, and finding a small hard uterus indicates that this is not the amenorrhea of pregnancy. If it is caused by genital insufficiency the uterus will be small and hard. If the patient is trying to get the physician to curette her, softness of the uterus will cause him to refuse it. Premenstrual congestion may cause a temporary enlargement of the uterus; hypertrophic sclerosing metritis will cause an enlargement of the uterus which is also softened, and only repeated examinations will enable us to differentiate it from pregnancy. A cyst of the ovary if small, may be mistaken for pregnancy. The feeling of a zone at the junction of cervix and body of a thinness like paper is a sign of pregnancy that has some value. There may be irregularity of the uterus due to implantation of the ovum in an unusual position. The author believes that in most cases it is possible to make a diagnosis of

pregnancy at the beginning. The most difficult to distinguish are the angular pregnancies, which it is most important to diagnose from extrauterine pregnancy.

Secacornin or Pituitrin Before Labor?—Herff and Hell (*Münchener medizinische Wochenschrift*, January 16, 1912) report their observations on a series of 100 cases in which inertia uteri was present and in which secacornin was given as an oxytotic. There were two maternal deaths, one from sepsis and the other from acute dilatation of the heart, neither of which was concerned with the administration of the drug. There were eight fetal deaths due to the following causes as determined by autopsy: cranial hemorrhage after forceps (one), asphyxia due to the cord around the neck, to prolapse of the cord, to placenta previa, to separation of a normally situated placenta, to compression of the cord by forceps (six); and one death from infection after labor in a septic mother. In none of these cases could the fatal result be attributed to the administration of the drug. In eighty-four patients spontaneous labor followed and in the remainder operative delivery had to be resorted to. The usual dose of the secacornin was half a gram, repeated if the effect seemed to be insufficient. In none of these cases did any atony result during the third stage and the placenta was delivered spontaneously. For the purpose of comparing the results obtained by the administration of ergot with pituitrin, the latter was given in thirty cases of labor and seemed to be without result in hastening this process. In consideration of the good results obtained in their series of cases the authors do not believe that the standard ergot preparations should be given up so readily, especially in view of the small doses which were found effective in those cases and the lower cost of the drug. They consider that in certain cases, however, the administration of the two may be combined.

Hypophyseal Extract in Premature and Full-term Labor.—Hamm (*Münchener medizinische Wochenschrift*, January 9, 1912) reports his observations on this preparation in a series of forty cases of labor at term, in which good results were obtained within two to five minutes after injection, as manifested by an increase in the intensity as well as the frequency of the pains. The author believes that the result should lead to its use in all cases where there are no anatomical obstruction to interfere with spontaneous delivery, as by this means the operative interference may either be entirely avoided or the maternal soft parts as well as the position of the child, improved to such an extent by the new pains that the subsequent operations may be carried out under better auspices.

Biological Studies on the Blood From the Mother and the Umbilical Cord.—Graff and Zubrycki (*Archiv für Gynäkologie*, vol. xciv, No. 3, 1912) contribute a study on the blood from these two sources in which they sought to determine what biological conditions exist in the same as compared with that from carcinoma patients. They found that the serum from the cord is less

effective than the maternal serum in its heterolytic manifestations and that the cord serum is also poorer in hetero- and in iso-agglutinins. The cord serum likewise contains less complement and less thermostabile substances than the maternal serum, but the complement of cord serum can be preserved for a much longer time than the maternal serum. They also found that the resistance of the blood cells of the fetal blood against hemolysis by cobra toxin, is increased beyond the normal in blood obtained from the cord (which is analogous to the conditions which have been observed in carcinoma patients), but is reduced in the blood during pregnancy. No difference could be determined in the behavior of the blood corpuscles of pregnant women and those obtained from the cord, in the presence of saponin, solanin, tetanolysin and ricin.

Pregnancy in Both Tubes.—Davidsohn (*Münchener medizinische Wochenschrift*, January 16, 1912) reports a case in which an extrauterine pregnancy of equal age was present in each Fallopian tube in a woman thirty years of age, who had had two children and one miscarriage. About six weeks after her last period the woman suddenly went into collapse and a diagnosis of ruptured ectopic having been made an immediate laparotomy was done. Each tube was found to contain an ovum but only one had actually ruptured, the other one being in the process at the time of operation. The patient developed a septic peritonitis and died. The case is noteworthy because of the early date at which rupture occurred and shows the necessity of carefully examining both tubes in every case of diagnosed ruptured ectopic.

The Technic and Dosage of Salvarsan Injections in the New-born.—Engelmann (*Zentralblatt für Gynäkologie*, January 20, 1912) claims that the only way of influencing a syphilitic process in the new-born infant is by an intravenous injection in the cubital vein of the arm. This can be done without difficulty even in the smallest infants and is far more effective than secondary treatment through the mother. The dose of the drug which is sufficient to produce an effect must not be less than 0.04 grams and the writer treated seven cases (of which four were treated by injection by this method), in only one of which the treatment failed. Engelmann believes that the experience gained up to the present time contradicts the employment of the subcutaneous and intramuscular methods of injections and that comparatively large doses (not less than 0.04 grams) may be employed in the presence of a severe infection marked by pemphigus and similar lesions. In other cases where the process is not so extreme it may be possible to use a smaller dose. The writer recommends the repetition of the injections where improvement does not result and the same should be subsequently supported by the methods of mercurialization already in vogue. The advantage of the method resides in the fact that a better response to treatment is almost invariably obtained.

The Importance of Gynecological Treatment in the Insane.—

B. S. Schultze (*Gynaekologische Rundschau*, vol. vi, No. 1) again calls attention to the necessity and importance of having a trained gynecologist connected with the staff of every insane asylum who shall not only be prepared to make a gynecological diagnosis but also be able to operate in case of necessity. A considerable number of observers have reported a series of cases in which operations in insane women have produced an improvement and even a cure. He calls attention to the important results obtained by Hobbs in a Canadian asylum at London, Ontario. Schultze believes that every institution for the insane should be provided with the proper operating facilities and that the gynecological examination should be incorporated in the history of every female patient.

The Relation Between Hemorrhage and Changes in the Uterine Mucosa.—Scheckele and Keller (*Archiv für Gynaekologie*, vol. xcv, No. 3, 1912) have made an extended study based on 430 observed cases, of the relations between glandular hyperplasia of the mucus membrane of the uterus and uterine hemorrhages. The material studied was obtained by curettage and also from a certain number of cases of hysterectomy, and as the result of their investigations the authors come to the following conclusions; namely, that there exists a hyperplasia and a hypertrophy of the uterine glands which has no relation whatever to the menstrual changes which take place in the mucus membrane and which must be regarded as a pathological condition. These changes in the glands are not brought about by inflammatory conditions, and for this reason the expression "glandular endometritis" should in the future be avoided and in place of this, the condition should be referred to as a hyperplastic and hypertrophic endometrium. No etiological connection could be shown between these glandular changes and uterine hemorrhages. They may be present at the same time but are usually absent even in the presence of marked hemorrhage or may be well developed without there being any bleeding present at such a time. On the other hand in the presence of hemorrhage as well as in the various phases of the menstrual period, a dilatation of the vessels and an edematous condition of the mucous membrane is present, together with the changes in the interstitial connective tissue cells. The failure of curettage in cases of uterine hemorrhage likewise seems to point to the practical conclusion that there is no association between glandular hyperplasia or hypertrophy and chronic uterine hemorrhages.

The same authors also contribute a study on the relation of the so-called chronic metritis and cystic degeneration of the ovaries in their relation to uterine hemorrhage and have made an extensive histological study of the uterine tissues, as the result of which they claim that the causes of normal bleeding must be looked for entirely distinct from anatomical changes of the uterus. The attention is usually attracted to the ovaries,

as in these organs anatomical changes have been demonstrated in the presence of atypical uterine bleeding, but it is also true that these hemorrhages may be present without any demonstrable anatomical changes in the ovaries and at the present time it is impossible to claim the existence of any regular relationship between the two. This would exclude the influence of a chronic oophoritis or cystic degeneration of the ovaries. It seems necessary therefore that the functions of the ovaries be more carefully studied from the physiological standpoint rather than from the anatomical, if any association between their abnormal conditions and uterine hemorrhage is to be traced.

GYNECOLOGY AND ABDOMINAL SURGERY.

Radium Therapy of Vegetating Epithelioma of the Cervix Uteri, Primary or Recurrent.—H. Cheron and H. Rubens-Duval (*La Gyn.*, Dec. 1911) say that vegetating epithelioma of the cervix is distinguished from other cancers by its special anatomic-pathological form and its peculiar sensibility to the radium rays. The characteristics of these tumors, are soft, friable vegetations, later complicated by deep infiltration, repeated and abundant hemorrhages, and frequent, rapid recurrence after surgical removal, by reason of the great proliferative activity. In using the radium rays on these growths the ultrapenetrating rays of Dominici are used, the gamma and hard beta rays being applied. Massive doses must be given, and in order to prevent burning of the vagina it is necessary to filter the rays carefully by means of a silver or platinum container, and a lead envelope. The application should last from twenty-four to forty-eight hours. A previous slight application may be necessary to stop hemorrhage, and a curetting may precede the final application in case of very large and friable vegetations which prevent the radium tubes from being properly placed. The action of radium is to modify the nutrition and evolution of the cells, finally destroying them, and to produce reactions in the vascular connective tissue which cause obliteration of the nutritive vessels. Metastasis into the glands comes late in these tumors. These cancers are very hemorrhagic and very subject to infection, which makes them unfavorable for operation. Radium stops hemorrhage at once and if the necrotic masses are curetted away a better field is prepared for the final application of massive doses of radium. If the rays are used before surgical operation the tissues are hardened and operation is made easier; but if the radium rays are used too much before operation this hardening may render the removal of the entire uterus very difficult. In cases treated by radium and operation, recurrences are much less frequent. For such treatment three small tubes are inserted into the tumor three weeks before the projected operation. After this application the cessation of hemorrhage and infection allows the patient to regain a good general condition, and she is much better prepared

to endure a hysterectomy. In cancers with periuterine infiltration hysterectomy is contraindicated. Here radium is positively indicated. In post-gravidic vegetating cancers which are very malignant and of very rapid evolution, radium is our only resource. After hysterectomy radium is indicated to prevent recurrence in the surrounding tissues, and when this has occurred, to destroy the recurrence. After the application a marked serous transudation occurs, the pain is relieved, and appetite and sleep return. Menses are stopped in young women; and menopause symptoms take place. A cicatricial tissue takes the place of the wound and atrophy of the uterus if it has not been removed. The vagina may be sclerosed and contracted at the top. When care is not exercised a radium dermatitis occurs, the vaginal mucosa exfoliates, and in a few cases the character of the cancer cells is changed and they become insensible to the rays, and the cancer goes on increasing fatally, unaffected by the treatment.

A New Conception of Parasyphilis.—H. Danlos (*Presse méd.*, Dec. 16, 1902) has especially considered parasyphilis affecting the nervous system and particularly locomotor ataxia and general paralysis, in bringing forward a new conception of parasyphilis. Tabes and parasyphilis are rarely seen except among syphilitics; but the disease is not in its florid stage when the phenomena show themselves. It is very rare during the occurrence of tabes or paresis to find the usual manifestations of syphilis. Never has the treponema been found in the nerve centers in persons dying from these manifestations. Specific medication, so useful in other syphilitic conditions has little value in tabes or paresis, and is even dangerous to the patients. If these manifestations are due to the occurrence of a cured syphilis it results from changes caused by the previous syphilis. It may act in two ways; either by rendering the soil more suitable for the growth of some other micro-organism, or by a change in the cerebrospinal fluid, which gives to the cord its nutrition. Immunity is allied with the production of antibodies. It is not illogical to think that parasyphilis is due to the impregnation of the system with an excess of these antibodies. This theory leads to interesting therapeutic deduction. Antibodies and complement must be injected to prevent injury of the tissues.

Congenital Prolapsus.—Raoul Graf (*Monatsschr. f. Geb. u. Gyn.*, Dec., 1911) believes that in congenital prolapse the etiological factor is spina bifida. Tandler has described several cases in which the two conditions coexisted. The form of the perineum in both male and female infants with spina bifida is abnormal. The form is so typical that its presence suggests a search for a concealed spina bifida. The bladder and genital organs have all descended, and the bladder lies behind the symphysis instead of against the abdominal wall. The uterus is sunk into the small pelvis; the ovaries also have descended in the pelvis; and the recto-uterine sac is abnormally deep. In the male the

prostate is very low. If the fault were in the levator ani we should find pathological changes in it. It is so placed that the lumen of the pelvis is crater-form. The muscle is very thin, and without any supporting fat, and contains masses of connective tissue. These appearances are found when the fourth sacral nerve is involved in the spina bifida, since this is the motor nerve for the levator ani muscle.

Ascending Urogenital Tuberculosis in Woman.—Sugimura (*Monatsschr. f. Geb. u. Gyn.*, Dec., 1911) experimented as to the possibility of the ascent of tuberculosis into the female genital organs. He made use of the carmine test of Engelhorn, injecting the carmine into the upper part of the vagina of female dogs, and it was seldom found in the uterine horns. In most of the experiments of Engelhorn with carmine-cocoa butter, the coloring matter was found not in the uterine canal but in the connective tissue of the uterine wall, to which it came not from the uterine canal, but by resorption from the vagina through the ascending lymphatic vessels. Cocoa butter carmine is much lighter than the tubercle bacillus and thus the bacillus would not be carried upward as was the cocoa butter. Hence the author does not admit the possibility of ascending tubercle bacillus infection of the uterine system.

The Bloodless Treatment of Hemorrhoids.—Boas (*Münchener medizinische Wochenschrift*, Jan. 30, 1912) calls attention to a method of treating certain classes of hemorrhoids which is based on the natural processes of resolution which often occur in this condition. He claims that the former teaching which regarded a prolapsed hemorrhoid as undesirable, is entirely false and that the reposition of these prolapsed veins interferes with natural resolution. According to his theory, a favorable cure can be brought about by the production of an artificial prolapse of these varicose veins by means of a Bier's suction cup. Those cases are selected for treatment in which a prolapse of the varicose veins can be readily secured by the application of the cup to the anus for a period of from thirty to sixty minutes and results in the production of a perianal edema, which cuts off the circulation in the varices and causes their gradual disappearance. This usually occurs within the first twenty-four hours and is ordinarily complete in from three to five days. The phenomenon as described is illustrated by a series of consecutive pictures. Boas claims to have used the method for a period of four years with very good results. The pain which is often present may be avoided by suppositories of codeine and belladonna and usually disappears before the third day. Where it is persistent, applications of aluminum acetate solution or an ice bag are usually effective. Excoriations are treated with dusting powder. One of the advantages claimed for the method by the author is the fact that it does not interfere with the bowel movements. Rest in bed during the first few days is advisable and the lateral position seems to be more effective than the dorsal.

Hot Air Treatment in Gynecology.—Sieber (*Münchener medizinische Wochenschrift*, Jan. 30, 1912) presents a modified hot air apparatus which provides a constant current of varying temperatures as demanded by the individual case. The apparatus consists of a series of tubular celluloid speculæ, which may be connected with an electric heating apparatus in such a manner that a current of air can be delivered at the end of the speculum, without abnormally heating the latter. A temperature of 200° C. can be developed and the author has used the apparatus successfully in a large number of cases of pelvic exudate.

Labor After Anterior Hysterorrhaphy.—Schauta (*Monatschrift für Geburtshülfe und Gynäkologie*, February, 1912) contributes his views on the question of radical interference in cases of labor occurring after fixation and suspension operations on the uterus and from a consideration of all the factors concerned, believes that we should be less ready to interfere in a radical manner than has hitherto been the custom. He has thoroughly studied the literature of the subject and claims that in a great many cases anterior traction on the cervix will result in bringing the os into the axis of the birth canal and favor delivery by natural means. In cases where this is not successful, a sagittal incision of the anterior lip of the cervix is sufficient. This procedure is particularly indicated in vaginal fixation, as the bladder is sufficiently high in these cases to be above the pelvic brim. In a ventral fixation the bladder occupies a much lower position and must therefore be separated before the incision in the cervix is made. In a large proportion of these cases, the fetus lies in a transverse position, because the development of the uterus in its long axis is prevented, but there is nothing to stop its growth in a lateral direction. A version therefore is indicated followed by a breech extraction. Schauta believes that the elastic bag affords a favorable means for dilating the cervix in ventral suspension cases and aids in bringing the os into the line of the birth canal. Craniotomy is only indicated where the fetus is dead and the pelvis deformed. Referring to the large number of cases in which abdominal Cesarean section has been done, Schauta considers that in most instances this has been unnecessary and that a restriction should be made in the application of this operation. He claims that insufficient attention has been given to the less radical methods of delivery and that if these had been attempted the abdominal section would have been found unnecessary. He considers that it is only indicated in exceptional cases, where pelvic deformity is present as an added factor. Schauta believes that the prophylaxis in a labor following fixation operations is most important and also that the best results are obtained as regards the course of future labors by the so-called indirect methods, in which shortening of the round ligaments is employed, rather than by the production of a new band between the uterus and abdominal wall or an area of close adhesion.

The Pathology of Menstrual Bleeding.—Klein (*Monatsschrift für Geburtshülfe und Gynäkologie*, February, 1912) presents a study of the observations and investigations which have been made in this subject from a biochemical standpoint as this is related to the histological and bacteriological findings. It appears that histological research will only serve to explain many of the phenomenon of menstruation if it is supported by biochemical observations. Thus, it seems to have been shown that under the influence of the so-called oophorins, including folliculin, ovulin and lutein, the mucous membrane of the body of the uterus is able to convert the maternal blood in a certain way into nutrient blood or trophemia. If the ovum which is freed about this time fails to be fertilized, the resulting nutrient blood is simply extruded as menstrual blood. Both the nutrient and the menstrual blood are not coagulable. Klein states that membranous dysmenorrhea may be explained by a self-digestion of the spongy layer of the uterine mucosa. The pains which accompany this condition arise from insufficient formation of oophorins, as the result of which the uterine mucosa instead of noncoagulable blood, throws out blood which coagulates wholly or in part and these coagula are expelled by the resulting painful contractions of the uterus. Oligomenorrhea results from an insufficient production of oophorins as the result of which there is an insufficient swelling of the uterine mucosa and insufficient excretion of nutrient blood. This results in the well-known symptom-complex of early adiposity, scanty menstruation and either sterility or few children. On the other hand, menorrhagic disturbances may be regarded as due to physiologically increased excretion of menstrual blood following profuse formation of oophorins. The conditions known as fibrosis uteri and fatty degeneration of the uterine musculature are explained as physiological phenomenon of the senile or pre-senile states, and are circulatory in character.

ITEM.

The 106th Annual Meeting of the Medical Society of the State of New York to be held at Albany on April 16, 17, and 18 promises to be of unusual interest, the program covering a very wide range of subjects.

The Section meetings are all open to the medical profession. The meetings open to the public are the address of Dr. Wiley, Tuesday noon; the evening addresses on Prevention of Blindness, Prevention of Deafness, Prevention of Insanity, and Prevention of Tuberculosis; the address of Dr. Cannon on The Benefits of Vivisection to Mankind, and the papers of the Section of Public Health.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

ERB'S PALSY.*

BY

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(With illustrations.)

THE purpose of presenting this paper is to call attention to the prevailing error in the minds of the general practitioners—that nothing can be done for brachial plexus paralysis, commonly known as Erb's palsy.

Nearly all the cases that present themselves at the Hospital for Deformities and Joint Diseases inform me that their accoucheur, who is usually a man in general practice, had told them that nothing could be done in the way of treatment to aid in restoring function in the paralyzed arm of their afflicted child.

This seems particularly strange as nearly all the text-books on pediatrics advise treatment. The following paragraphs are taken from latest editions of the books of Kerley, Koplik, Holt, Chapin, etc.:

Chapin and Pisk.—Treatment should be begun as early as the third month, and should consist in frictions or massage and the persistent use of electricity. If the muscles react to the faradic current, it may be used; but if not, galvanic current must be employed. The treatment must be continued for several months or until recovery is nearly complete.

Kerley.—Under massage and electricity, the improvement in the arm is often most satisfactory. It is not well, however, to promise the parents that a normal arm will be the outcome.

Koplik.—After two weeks, friction massage, and a mild electrical current of the faradic variety should be applied.

Holt.—The treatment consists in the use of massage, manipulation, and electricity, which should be begun at the end of the

*Read before the Pediatric Section of the New York Academy of Medicine, January 11, 1912.

first month, and used regularly and systematically for months. If the muscles respond to faradism, this may be employed, but, in most severe cases, they do not, and galvanism must be used, according to the rules laid down for facial paralysis.



FIG. 1.

FIGS. 1 to 9.—A group of children showing Erb's paralysis. In case 9 both arms are involved.



FIG. 2.

The literature of this disease dates back to the case of compression paralysis of the arm recorded by Smellie in 1768. This was a compression paralysis occurring in labor with a face presentation. Owing to the long compression to which the child had been subjected, both arms remained paralyzed for several days.

Jacquemier, in 1846, reports a case of palsy of the upper arm which recovered inside of a month. Danyon, in 1851, reports a case of a rather severe type of this lesion of the brachial plexus, in which the child died at about three months, and in which a



FIG. 3.



FIG. 4.

hemorrhagic infiltration was found in the entire brachial plexus at autopsy.

Other cases reported are those of Doherty, Mattei, 1862, Gunoit in 1864, Depaul, 1864. Duchenne describes two forms of brachial plexus paralysis in the new-born: (1) Compression

birth paralysis, the result simply of pressure. (2) Laceration birth paralysis from overstretching of the nerve with resulting laceration in various degrees of the nerve sheaths and their containing vessels, as well as of the nerve fibers themselves.

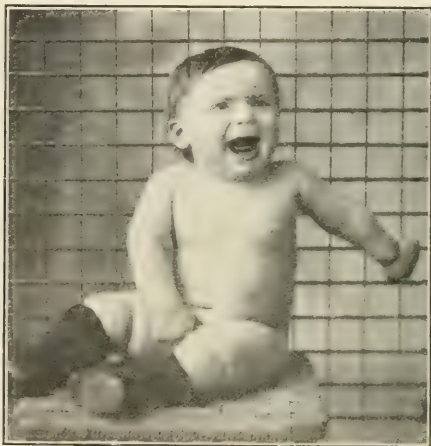


FIG. 5.



FIG. 6.

After Erb and others had described the same type of paralysis in adults, cases of obstetrical paralysis were reported by Schultz, Schumacher, Kustner, Thorburn, Ballenhagen, Hochstetter,

Fieux, and many others. Fritsch reported a case of paralysis of the arm in a child two days old, associated with a hematoma due to compression of the sternomastoid muscle, showing the hemorrhagic nature of the lesion, which until that time had never been mentioned in the literature of the subject. The paralysis in this case disappeared after the absorption of the hemorrhage. In the case of Erb's laceration of the brachial plexus, reported in 1874 and published in 1877, the injury was supposed to be due to the use of the finger as a hook in the axilla in a case of version in forcible extraction of the child. Cases are reported by Bernhardt



FIG. 7.

in 1888, Thorburn in 1886, also by Hammond in 1881 and Roullands in 1886. Kustner in his report in 1889 insisted that the Erb obstetrical paralysis must be due to bone injuries, especially fractures at the upper epiphyses of the humerus. Schultz was the first to direct his attention to the pathogenesis of this condition. He described a case of breech presentation with paralysis which was produced by bringing down the right arm behind the head. Aranse in 1889, at Gottingen, reported a case of obstetrical paralysis, also a breech presentation with a bilateral Erb's paralysis resulting. The left arm recovered rapidly. Comby, Jaffroy, Burr, and Lovett report cases. Guillemot in 1897 reported thirty cases of Erb's paralysis pro-

duced in the practice of a single midwife. Schumacher in 1899, in a collection of ninety-five cases, found fifty-three head presentations and forty breech cases. Of the fifty-three head presentations, forceps were used in twenty-eight, the birth was spontaneous in ten. The fingers were used as a hook in axilla in ten cases. Of the breech cases, six were spontaneous and thirty-four assisted. It is quite evident that in most cases, Erb's paralysis is due to forcible manipulation in the process of delivering the child.



FIG. 8.

Etiology.—It would appear that most cases of Erb's paralysis are the result of a difficulty occurring in the size of the maternal outlet compared with the size of the child, which necessitates forcible traction or compression. According to the statistics of Duvall and Guillant in 1901, brachial plexus paralysis occurs in about one case in 2000. If this be true, in our population of 5,000,000, there would be 2500 cases.

Four explanations for brachial plexus paralysis are given by A. S. Taylor.

1. The backward pressure on the nerves by the clavicle; (a) on the transverse processes of the vertebræ, (b) on first rib.
2. Hyperextension of forceps.
3. Pressure of the forceps.
4. Tension on the nerve roots.

In breech presentations the lesion occurs in the delivery of the after-coming head; the fingers hooked over the back of the neck pull both shoulders down and are over the head and neck. Here again, rotation or oscillation increases the strain on the nerve roots. Moreover, the tips of the fingers hooked over the shoulders lie upon the stretched nerves and add a lateral strain to the tension already suffered from. It is evident that any form of traction which pulls the head and neck away from the shoulders is the exciting cause of the lesion. As a natural corollary, the lesion may occur with any presentation.

SYMPTOMS AND DIAGNOSIS.

The arm hangs helpless by the side and cannot be abducted at the shoulder because of palsy of the deltoid and supraspinatus muscles. The forearm is extended and cannot be flexed on



FIG. 9.

account of the paralysis of the biceps, brachialis anticus and supinator longus. The hand is in extreme pronation because of palsy of the supinator brevis and biceps, and the entire arm is so rotated inward that the bottom of the hand may look backward and outward. The humerus is markedly rotated inward as a result of paralysis of the supraspinatus and infraspinatus and teres minor muscles. Where laceration of the nerve roots has occurred, there is present a picture of very great significance in the early treatment and prognosis of the condition. When an

infant remains peevish and fretful for a considerable period of time after this accident at birth, and when handling of the extremities gradually increases the pain and irritability, there is present a traumatic neuritis aggravated by pressure and incident to the blood clot and rent in the perineural sheath.

Cases that do not present this symptom will show a more or less complete spontaneous recovery, while in those cases presenting these signs of the neuritis, a considerable palsy will



FIG. 10.—A case of Erb's paralysis of both arms with improvement after the age of $2\frac{1}{2}$ years.

follow, depending upon the severity of the lesion. In severe cases, after several months, the internal rotators, especially the pectoralis major, become markedly contracted, further increasing the deformity of the arm at the shoulder joint. This combined with the paralysis of the external rotators may lead to more or less posterior displacement of the head of the humerus. There are present also some contracture at the elbow preventing

full extension and more or less flexion contracture and ulnar adduction at the wrist.

PATHOLOGY.

"To properly appreciate the lesion in these cases, the etiological importance of the overstretching process in its production at birth must be borne in mind. Furthermore, a study of the lesion



FIG. 11.—An apparatus for approximating the lacerated ends in traumatic brachial plexus paralysis; also used for cases of Infantile Paralysis, where there is a relaxation of the muscles and ligaments, and subluxation of the shoulder joint.

should demonstrate not only the characteristics of the degenerated areas, but also the reasons for the failure of complete regeneration following the accident. The severed nerve ends are in apposition in the vast majority of instances; when such condition is brought about surgically, union, regeneration, and recovery of function occur without incident. Why are these cases exceptional in this particular? In this connection several points must be borne in mind: 1. The force producing the lesion is variable; the lesion, therefore, varies in extent with the variation in the extent

and character of the force producing it, as has been pointed out. In the milder (most usual) cases, only the fifth and sixth cervical roots suffer, while the severer cases present a literal severing of the roots of the plexus, varying in number from one to three, or even



CASE A. FIG. 1.



CASE A. FIG. 2.

Normal range of motion with some shortening.

more. 2. The nature of the force producing the lesion is such that the nerve roots are pulled apart rather than severed clean at a given point. The lesion, therefore, is incomplete at any given cross-section of the nerve bundle, and involves different fibers at different levels. 3. The nerve bundle is surrounded by a

dense sheath of connective tissue, the perineurium, which supports it and the vessels supplying it. In any lesion of the nerve roots resulting from an overstretching process this supporting sheath must first give way. In these cases, it is torn asunder and the arterioles belonging to it and supported by it are ruptured. A hemorrhage into and beneath the perineural sheath and



CASE A. FIG. 3.

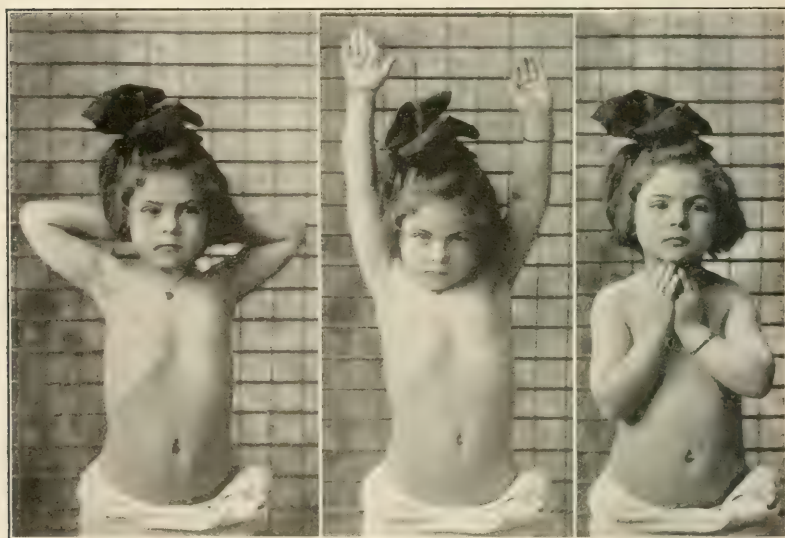
infiltrating the strands of nerve fibers and the meshes of the epineurium results. In the recent state, a small hematoma infiltrating these structures forms at the point of rupture."

TREATMENT

The time of treatment depends upon the nature and extent of the laceration of the brachial plexus.

Personally, I think it depends on the time when treatment is

begun, and the kind and character of the treatment pursued. Like all forms of physical injury, the earlier we direct our attention to assisting nature in its reparative processes, the nearer we can expect to reestablish a normal condition. What I am about to advise in the way of care and treatment, is the result of an experience obtained from over one hundred cases, in some of which treatment has been instituted within forty-eight hours after birth, in various other cases the treatment has been greatly delayed. In one of the cases presented here this evening, nothing was done until the young lady had passed her twenty-



CASE. B. FIGS. 1. 2. 3.—Normal range of motion with some shortening.

second birthday, and even at so late a date marked benefit has been observed and considerable further improvement is expected.

If the child is seen immediately after birth, or within the first week, much benefit may be expected by approximating the lacerated ends of the torn nerves. This can be done by a long sleeve, extending down over the hands, up about the neck, and around the chest under the arms. It is so made; that it can be drawn snug and the hand brought up back of the neck, the extended sleeve being attached by safety pins or by being sewed. If the position is to be maintained, as can be done by means of an appliance, made of soft leather as herein presented in

Figure 11, the apparatus goes about the body and is fastened by laces; by means of a screw arrangement the fore-arm can be held either at a right or at an acute angle. Should a clot be present, the absorption may be hastened by the use of a high frequency current, once or twice daily, for a period of five minutes. Following this, I have used a combined galvanic and faradic



CASE B. FIG. 4.

current, interrupted seventy-two times a minute, which is accomplished by a clock arrangement in the wall plate. I am personally of the opinion, that a contraction synchronous with the heart beat is an added efficiency to the electrical current. The current should not be strong enough to produce sufficient pain to cause the child to cry. There is a danger of causing a destructive degeneration by too strong a current and thus

defeating the object which we are desirous of obtaining. To preserve the muscles' tone and function, mild massage to the fore-arm and shoulder should be given; but damage may also be done by too long and too vigorous massage treatment.

When children come under our observation later in life, after the fourth year, we add a series of exercises. These muscle movements are gone through before a mirror, and the patient is



CASE C.

taught to concentrate his mind on the physical effort. If the child is unable to go through the normal range of motion, the attending nurse assists him in his effort, and the work is kept up in this way, until the muscles come under the control of the will.

The good results obtained in children treated immediately after birth, will be credited by some to what would have occurred by Nature's spontaneous resolution yet where spontaneous resolution leads to a good result in function, we have a shortened arm, showing an injury to the trophic nerves. In most cases

we can feel that the result is far better when aided by treatment. We must regard cases as a true Erb's Paralysis, where in the beginning there has been loss of function with the bird-claw position of the hand and in which a return of normal function is accompanied by a shortened arm.

By restricting the motion of the good arm during the hours of play in children over three years of age, which necessitates the use of the arm affected with the Erb's Paralysis, much is gained



FIG. 1.

FIG. 2.

CASE D.—Normal range of motion with some shortening.

by the use of the damaged muscles. This should always be done in children between the third and ninth year. Later the necessity of using the affected arm can be impressed upon children's minds so that restriction of the good arm is unnecessary.

The first five cases presented this evening, have come under my personal observation, in the first two weeks after birth. I merely wish to call attention to the extent of their range of motion, and also that the affected arm is shortened as compared with the good arm which confirms the diagnosis of an injury to the brachial plexus.

Not wishing to take up the time of the Section with the history of a great number of cases, I will select four typical histories.

CASE A (Figs. 1, 2, 3).—(This type of history is common at the Hospital for Deformities and Joint Diseases.)

The family physician, Dr. Newfield, referred the child to the clinic when she was four months old. For the first two and a



CASE D. FIG. 3.—Normal range of motion with some shortening.

half years she received combined galvanic and faradic current for one week, and the following week was treated with sinusoidal current (as the current is changed every week for paralysis cases). From the age of three years she had received, in addition to this, a series of exercises before the mirror, in which she was taught to concentrate her mind on the physical effort, and it is quite remarkable how well young children develop their ability

to concentrate their minds in following their physical motion. As she is now presented, although having some shortening in the length of her arm, with a corresponding relative decrease in the bony structures, as compared to the good arm, she has the ability to go through a normal range of motion.

CASE B.—Patient of Dr. John Blake White. Patient came under observation several weeks after birth, in the second month of the existence of the institution in 1906, having the characteristic bird-claw position, the arm being absolutely limp and useless. She had come to the clinic against the advice of her physician, who claimed that nothing could be done for this condition. As in the previous cases, were it not for the shortened arm, her range of motion being similar to the other side, one might question the original diagnosis, and I am quite convinced that in this case, as in all others, if nothing had been done in the way of treatment, the result might be like Case C.

CASE C.—This patient, twenty-two years of age, had made no effort at treatment. She came to the institution three months ago, having met a patient who had been markedly improved. Both herself and her mother seemed greatly pleased though quite skeptical as to what might be accomplished at so late a date; but under treatment marked improvement has been observed in the function of the hand and forearm, also in the development of the muscles of the arm, and I am looking forward, even at this late date, to a marked improvement. The patient, whom you have seen, will assure you of the improvement, thus far.

CASE D.—Came under treatment with a frail arm at the age of five years. Now has a normal range of motion, although a markedly shortened arm.

The cases presented and many others under treatment, demonstrate, that by patient, persistent treatment, although sufficient damage is done to the trophic nerves at the time of birth to affect the muscles of the arm and the osseous structures about the shoulder-joint, we may still obtain an arm that will be practically normal in its range of motion.

783 LEXINGTON AVENUE.

THE TREATMENT OF FRACTURES AT THE ELBOW IN CHILDHOOD.

BY

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As Kismisson has remarked "Fractures of the elbow are *par excellence* the fractures of childhood." Not only their frequency, but their gravity, lays a heavy burden of responsibility upon every practitioner; for these fractures imperil the function of the

joint and the usefulness of the limb is at stake. In childhood the elbow is a center of traumatism because it is a point of diminished resistance.

The lower extremity of the humerus with which the bones of the forearm are in intimate relation is in process of development and ossification—it is an unfinished product, and as yet unprepared to offer resistance to an unusual strain. But the unusual strain is frequent in childhood as an instinctive means for defense and protection; when the child falls the arms are naturally projected in front and interposed between the body and the ground; the shock transmitted from the ground to the shoulder is centered at the elbow, in great part upon the lower extremity of the humerus, and the articular surface is not only broken but the fragments usually dislocated, so that consequences singularly complex are the result.

Here there is a joint of great functional importance presenting a lesion of great complexity. The problem is not a simple one, since it involves a reduction that not only restores continuity of the fragments, but functional activity of the joint. It is obvious that in the fracture of a long bone a slight displacement of the fragments is compatible with perfect functional result; but in fracture of the elbow even slight abnormal prominence in the interior of the joint will be an obstacle to the normal joint movements, and may be the cause of a permanent infirmity.

Again, it must be emphasized that under the most favorable conditions of treatment perfect results cannot be guaranteed; the prognosis must always be guarded and the possibility of functional impairment emphasized. However, the best results can be obtained only when treatment is based upon exact knowledge of the mechanism of the joint and of the damage caused by the traumatism. These facts are the only safe guide in reducing the fragments and maintaining them in permanent position.

Again, it must be remembered that the child's elbow is not a miniature adult elbow, it is a joint formed by epiphyses in the process of development. An exact knowledge of the development of the elbow is necessary to properly interpret the radiograph and reduce the fragments. The surgeon must know the normal before he can interpret the pathological; he must be familiar with the precise situation of the centers of ossification in the epiphyses, their form and value, and how they look in the

picture. It is easy to mistake a conjoined cartilage for a fracture line, or a center of ossification for a detached fragment.

Method of Examination.—The obstacles in the way of a thorough examination are many: the child cannot be interrogated; the history of the injury cannot be obtained at first hand; the surgeon must rely solely on his own ingenuity in interpreting the facts. These facts are gleaned principally by inspection and palpation; but the child resists a local examination, the muscles are contracted and the condition thus obscured; hence the necessity of anesthesia, not deep, but just sufficient to relax the muscles and permit free palpation.

Never hesitate to give an anesthetic of short duration for the examination of every elbow injury.

First, inspect the elbow and note the localization of the ecchymosis; if it surrounds the elbow, suspect supracondylar fracture; if it localizes at the sides, look for fracture of the condyles. Second, palpate the parts; note the normal anatomical relations of the uninjured elbow—(a) *the relation of the three bony points*. Place the thumb and middle fingers on the internal and external condyles, and the index-finger on the tip of the olecranon. When the forearm is fully extended, the three bony points lie on the same transverse line. Any modification of the normal relations of the three bony points is due to fracture or dislocation.

(b) The head of the radius can be felt in the dimple behind the elbow. Its rotation is manifest when the forearm is pronated and supinated. In injuries about the elbow the determination of the position of the radial head is of prime importance.

(c) Compare the “carrying angle” of the two arms—the obtuse angle which the extended forearm forms with the arm; this angle is modified in certain fractures of the elbow.

(d) Note the movement of the elbow-joint, both flexion and extension. Remember there is normally no lateral motion in the extended elbow-joint.

With these standards of comparison, the injured elbow should be carefully palpated and the presence of crepitus and other abnormalities determined. These manipulations should be conducted in a gentle, delicate manner, nor should force ever be used sufficient to exaggerate the lesion and destroy the valuable periosteal connections.

The Value of the x-Ray Examination.—The final word of diagnosis belongs to the x-ray, nor should it ever be omitted when the injury appears trivial. It is impossible by palpation alone

to discover all the details of a fractured elbow. In the radiograph we have a valuable aid in making a precise diagnosis. We do not believe the radiograph is sufficient of itself, nor is it to supplant the clinical examination, or relegate it to a second place; but the clinical and radiographic examination taken in conjunction each interprets the other.

After thorough palpation the x-ray enables us to correct errors; to confirm a diagnosis already made, and to give mathematical precision to our conclusions; and finally when the reduction is made and retention splint applied it checks the final error of imperfect reduction and retention.

The radiograph should be taken and interpreted by those who possess special knowledge and experience. An amateur x-ray picture of an injured elbow is of little value. However good the picture, it is valueless unless properly interpreted. As already stated the child's elbow is not a miniature adult elbow, it is a joint in the process of development—it consists of osseous regions, cartilaginous regions and centers in process of ossification; its parts are of different density and offer a different resistance to the penetration of the x-rays. The essential factor in the picture is detail, hence the necessity of using soft tubes.

In radiographing an injured elbow there should always be two pictures of the same fracture, a surface radiograph and a profile radiograph.

a. The surface radiograph should be taken with the arm in complete extension, the arms resting on the plate on its posterior surface.

b. The profile radiograph should be taken with the elbow in median flexion, the hand pronated, with its internal surface resting on the plate.

It is obvious that the child should be anesthetized in order that the proper attitude may be assumed without provoking pain.

After the diagnosis is confirmed, the reduction made, and the splint applied, a second x-ray should confirm the accuracy of results.

The prime consideration in the treatment of fractures of the elbow is not simply a reduction that restores continuity of the fragments, but one that restores functional activity of the joint. It is obvious that reduction here is something more than the reposition of fragments; it implies a coaptation so accurate and a retention so complete that the resulting joint surfaces will permit of normal joint movements.

If the fragments be accurately reduced and held in this position, the question of duration of immobilization and the special position in which the limb should be placed are secondary considerations. The fundamental fact must be appreciated that it is not the duration of the immobilization that produces ankylosis, it is faulty reduction causing periosteal proliferation that locks the joint. Furthermore, no special position of the arm will obviate the disastrous results of an incomplete reduction.

The general rule to be followed in all cases of fractured elbow is, accurate reduction maintained by that splint and that position of the arm which is best suited to the special indications of the individual case.

It is futile and misleading to presume to indicate precise methods of treatment invariably applicable to each variety of fractured elbow. Even in the same type of fracture there are anatomical differences which must be appreciated. Some displacements are corrected by traction, others by direct pressure on the fragment. *Each fracture is a special problem with its individual needs, and its peculiar indications, while, therefore, no precise rules can be formulated, certain precepts may be followed which will be a safe guide in all cases.*

First Step.—Find out exactly just what is fractured and be satisfied with nothing but anatomical accuracy. A clinical examination under anesthesia is the first requisite, but it is never sufficient; it must be supplemented by an x-ray examination. The radiographs should be made and interpreted by a radiographer of experience. *The x-ray picture without proper interpretation is useless.*

Second Step.—Reduce the fracture by such maneuvers as are efficient in accurately coapting the fragments (flexion, extension, traction, direct pressure, etc.). A maneuver is selected for its efficiency and not according to precedent. Whatever the maneuvers required, care should be taken to avoid any rough manipulation which only exaggerates periosteal lesions and consequent impairment of function. Firmness and gentleness is always more effective; they accomplish more and damage less.

Third Step.—Immobilize permanently only when certain that reduction has been obtained, and that the position of the arm, and the splint selected are adequate to maintain reduction. This will be evidenced by (a) normal confirmation of the parts; (b) a normal range of flexion and extension; (c) the confirmation of a second radiograph. The procedure should be as follows: after

reduction has been obtained, and the arm placed in that position which seemingly is most efficient in maintaining reduction, a *temporary splint* should be applied and a radiograph taken; if the picture confirms the accuracy of reduction and efficiency of immobilization, then the temporary splint should be made permanent. *And no permanent immobilization should be attempted until satisfactory evidence has been obtained that the reduction, position of arm, and splint are as perfect as the character of the injury permits.*

Lastly.—In the choice of splints, preference should always be given to plaster of Paris. No other form of splint can be moulded so accurately or held so securely—an important consideration where the child's restlessness predisposes to secondary displacement.

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THE BLOOD IN INFANCY AND CHILDHOOD.*

BY

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THERE are certain differences in the blood in childhood from that in the adult both in health and in the reaction to disease. It is the purpose of this paper simply to take note of conditions in which a clinical blood examination might be of value in children and to interpret such examinations noting especially the differences between the blood of the child and the adult.

Considering first the differences in health: For a few weeks the hemoglobin is high, not due entirely if at all to a polycythemia, for the color index is frequently above 1.00, but to an actual excess of coloring matter in the cells. After this the hemoglobin is apt to run rather low.

The Erythrocytes.—At birth the red cells are somewhat increased, the count being about 6,000,000. They increase considerably for a day, counting 7,000,000 to 9,000,000 at the end of the first day, then drop to 6,000,000 at the end of four days, and to 5,000,000 at the end of a week, at which point they stay, practically the same as in the adult. It is said that early ligation of the cord reduces the number of red cells by a half million. For a few days nucleated cells, normo- and megaloblasts are found and they are found in the circulating blood on slighter

* Read before the Brooklyn Pediatric Society.

provocation than in the adult; the same is true of poikilocytosis. Rouloux formation is less distinct.

The Leukocytes.—Their number varies greatly and different observers have reported very different results, but there seems to be an average of about 18,000 for the first forty-eight hours, followed by a gradual decline in the course of a week to 10,000 or 12,000, where the count remains for the first year. The changes which are normal in adult life, and the variations after eating, exercise, etc., are fully as great or greater in infancy. The differential count in infants and young children, however, shows a marked difference; the following table will give an average of counts:

Age years	Leuko- cytes	Lymphocytes		Transi- tionals	Polymorpho- nuclears	Eosino- philes	Mast cells
		Small	Large				
4-1	10,900	45.57	13.33	2.02	36.78	2.13	.07
1-2	11,600	41.55	13.86	1.53	42.66	1.45	.03
2-3	12,300	35.57	10.74	1.15	49.94	2.30	.01
3-5	10,800	27.62	9.06	.72	59.37	2.73	.15
Adult	7,500	25.00	6.00	.75	66.00	2.00	.25

During the first forty-eight hours of life there are 60 to 75 per cent. of polymorphonuclears. It is in the differential count that we have the most substantial difference between the blood of infancy and that of adult life; the polynuclears are but little more than half as numerous in the infant, the deficiency being made up by an increase in both the large and small lymphocytes to nearly double the adult percentage.

ANEMIAS.

The blood of children being less stable than that of adults, the reaction to causes of anemia such as acute gastrointestinal disorders, the acute exanthemata, pneumonia, etc., and the chronic infections as tuberculosis and syphilis, is greater than in the adult. The hemoglobin is much reduced, at times being as low as 20 or 30 per cent. The red cells, in addition to being deficient in coloring matter and reduced in number, are apt to be of irregular shape and staining reactions, and to include many normo- and some megaloblasts. A marked poikilocytosis is often present. The spleen is frequently enlarged and there is a leukocytosis, this being of the polynuclear variety. The changes are similar after hemorrhage and the recovery slow, so that operative loss of blood must be avoided as far as possible.

Pernicious anemia, if it occurs, is rare. The blood changes are similar to those in the adult; *i.e.*, marked diminution in red cells, marked diminution also in hemoglobin, but to a less extent than the number of the red cells, giving a high color-index; marked poikilocytosis with nucleated red cells; a low leukocyte count.

The position of the *Von Jaksch anemia* or anemia pseudo-leukemia infantum cannot be said to be fully established. The blood changes are as follows: Marked diminution in hemoglobin and in red cells; to 20 or 30 per cent. in the case of the former, and to 2,000,000 or even less in the latter, with marked poikilocytosis and the presence of nucleated red cells. A considerable leukocytosis, to 50,000 or even 100,000 with the varieties about proportionate to the normal but without the presence of myelocytes, occurs. These changes could not be said positively to take the disease out of the category either of a secondary anemia of severe grade, or of a leukemia with a moderate increase of leukocytes. The further fact that nearly, if not quite, all of the reported cases are said to have been subjects of either congenital syphilis or of rachitis, might also add to the suspicion that the disease is only an intractable secondary anemia. Still, the degree of blood change, the lack of response to treatment, the greatly enlarged spleen and moderately enlarged liver would make it wise to retain it, at least provisionally, as an entity.

Leukemia of both forms rarely occurs in childhood and, when it does, the changes are the same as in the adult; a great increase in the lymphocytes in the lymphatic type, and the occurrence of the myelocytes, in the splenomyelogenous type. In both types there is, of course, a large increase in the total leukocyte count.

Chlorosis is not a disease of infancy or early childhood and in such diseases as purpura and hematophilia there is not, so far as observed, any characteristic blood-cell change. It is unnecessary, therefore, to consider these conditions.

In surgical diseases with suppuration, a leukocytosis is present, but as this so easily occurs physiologically, the item of importance is the differential count, and it is to be remembered that up to five years of age a polynuclear count normal to the adult, *i.e.*, 66 per cent. and in younger children, even less, is really a polynucleosis and is so to be reckoned in the diagnosis of suppuration.

In typhoid fever, as in the adult, there is a marked leukopenia, the leukocytes often being reduced to 4000 or 5000.

In pneumonia there is usually a very marked leukocytosis, the count running up to 30,000 or even 50,000. The exceptional

cases are where the reaction is weak to a virulent infection. Also where the infection is mild, the reaction is slight and there is little or no leukocytosis. With a fall of temperature by crisis, the leukocyte count usually begins to fall a little before the fever but comes down more slowly.

Among the infectious diseases scarlet fever causes a marked leukocytosis. In diphtheria a leukocytosis occurs but is less marked.

In contrast, measles is accompanied by leukopenia, the white cells being reduced to 5000 or thereabouts.

Acute articular rheumatism causes more or less leukocytosis but no blood change of diagnostic or prognostic import, so far as I have been able to learn.

In all forms of meningitis there is usually a pronounced leukocytosis, from 20,000 or 30,000 up to 50,000, but this is not constant and has no diagnostic significance to distinguish the disease from other inflammatory conditions nor one type of the disease from another.

Influenza seems to cause a leukopenia and so has uncomplicated tuberculosis, but when there is a mixed infection there is usually a leukocytosis.

Pertussis holds rather an unusual position in that there is a leukocytosis of the lymphocytic variety. There is apt to be an absolute leukocytosis, but whether there is or is not, there is a relative increase in the small lymphocytes particularly. This blood change occurs quite early and is strong confirmatory evidence of the disease. Of course the normal percentage for the given age must be carefully considered, using such a table as that given above, in deciding the question of lymphocytosis.

Trichiniasis in children does not cause a different blood picture from that found in adults but is mentioned because of the striking eosinophilia, from 30 to 50 per cent. of all the leukocytes being eosinophiles.

SYMPTOMATOLOGY OF INFANTILE PARALYSIS.

BY

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(Concluded.)

RECLASSIFICATION OF TYPES OF POLIOMYELITIS.

(Modified from Wickman, and Reginald Miller to whom we are indebted for much recent knowledge of the disease.)

I. *The Arrested Type.* (Most frequent. Abortive; old classification.)

II. *The Spinal Myelitic Type.* (Flaccid paralysis.)

III. *Acute Ascending or Descending Spinal Paralysis.* (Landrys.) (Separation from Type II arbitrary. Both spinal origin.)

IV. *Acute Bulbar.* (Cranial nerve paralysis: facial, auditory, hypoglossal, oculo-motor; acute respiratory paralysis.)

V. *Encephalic Type.*—Polioencephalitis superior: Rolandic cortex—spastic hemiplegias. Frontal area—mental defectives. Occipital area—blindness with normal eye grounds.

Polioencephalitis inferior: Acute bulbar pontine type; see above.

Encephalitis cerebelli. The predominant *acute ataxia type.*

Encephalitis of midbrain and connections. *Acute Tremor.*

Thalamic encephalitis. Spastic para or hemiplegias associated with athetoid and choreic movements.

VI. *Meningitic Type.*—With or without paralysis.

VII. *Neural Type.*—Acute multiple neuritis. Sciatica. Herpes zoster. Chorea.

VIII.—*Rapidly Fatal Institutional Disease Type.*

There may be no marked distinction between the types of poliomyelitis; they may pass one into the other, differing only in degree; the encephalic type may present symptoms of spinal involvement and *vice versa*; the localization of this disease may exhibit every caprice of selection.

The symptom-relationship between all types is shown most clearly during the earliest stages of the disease, for all types present a similar onset. This symptom-group of onset is also the clinical expression of the most numerous class of cases, the

arrested, formerly called the abortive type of this disease. Next in frequency appears the typical form of the disease known as infantile paralysis, characterized by a flaccid and regressive paralysis of muscles supplied by spinal nerves. Every epidemic also presents cases where most pronounced symptoms indicate meningeal, pontine, cerebellar or cerebral involvement. Some hesitation has been shown in ascribing peripheral neuritis, whether multiple in character or of single neuron involvement, to the same cause. Clinical evidence of such relationship has accumulated, and pathological confirmation is confidently expected.

I. SPECIAL TYPES. THE ARRESTED (SO-CALLED ABORTIVE) TYPE.

The arrested form of poliomyelitis is given first in the reclassification of the types of this disease for the following reasons:

1. The arrested form occurs more frequently than any other form, probably more often than all others.
2. Transmission of poliomyelitis may be largely due to frequent undiagnosed cases of the arrested type.

The change in the name of this type of poliomyelitis from abortive to arrested was determined on for the following reasons:

Ignorant of the exact method of transmission of this disease, and lacking an antitoxin for prophylaxis and cure, it is certain that the epidemic will be checked in but one of two ways:

- (a) By the exhaustion of the material on which it feeds.
- (b) By enlisting the intelligent cooperation of the public to aid in the detection and regulation of every focus in which it has located, but to insure intelligent attention we should not use misleading terms. The word abortive is clear to the medical man, for its adverbial medical meaning is "tending to shorten in course." To the laity in this connection the word is dangerously misleading, as its common adverbial meaning is "coming to naught." Miller's term "rudimentary poliomyelitis" is better, and yet lacks somewhat of precise definition.

The arrested case of poliomyelitis may transmit the infection to those with whom he comes in contact; he may himself develop within a longer or shorter period the typical paralytic form of the disease. In other words this individual has the disease, but owing to some fortunate bodily resistance the disease is arrested. If fatigue or exposure lessen the resistance, the disease may proceed to any one of several terminations. For

these reasons we recommend and employ the use of the definite and true descriptive adverb arrested to the most common type of poliomyelitis, rather than the misleading term abortive.

The proof of the existence of the arrested forms of poliomyelitis has been summarized by Frost(15) as follows:

Etiologic identity of abortive (arrested) and paralytic forms:

(a) Cases presenting the same initial symptoms as paralytic cases occur coincidentally in epidemics and recover in a short time without paralysis.

(b) Every closely studied epidemic shows a gradation in severity of nervous symptoms; extensive permanent paralysis; slight transient paralysis; partial paralysis (paresis); ataxia without paralysis; meningitic or neuritic symptoms without motor disturbance; general infection without distinctive nervous symptoms of any kind (basilar headache and cervical tension always present). A group of cases showing all these gradations, occurring within a circumscribed area within a short time, all presenting somewhat similar initial symptoms seldom fails to convince the observer of the existence of abortive (arrested) cases of poliomyelitis.

(c) The occasional occurrence of such cases during an epidemic of poliomyelitis might be put down to merely coincident prevalence of two or more distinct infections; the frequent, almost constant occurrence of such cases in intimate association with frank cases of poliomyelitis cannot be ascribed to fortuitous coincidence.

(d) Experiments have demonstrated that monkeys inoculated with poliomyelitis occasionally develop an abortive form of the infection, characterized by rather mild and indefinite symptoms. Roemer and Joseph have demonstrated in monkeys an immunity following such abortive attacks.

(e) Netter and Levaditi have shown that the serum of a child recently recovered from an abortive attack (arrested type) was capable of neutralizing the virus of poliomyelitis. It is, therefore, well established by clinical and experimental evidence that the infection of acute anterior poliomyelitis may cause slight illness without definite motor symptoms.

Frequency of the Arrested form of Poliomyelitis.—Recent extensive study of epidemics of poliomyelitis in small communities have made it evident that the arrested form of the disease occurs as frequently as any other type, and perhaps more often than all other types taken together. In the careful investigation

of the following epidemic in a school district in Iowa, five cases out of every six were of the arrested form, or twenty-five of the thirty cases seen.

Frost(16), Public Health Bulletin.—An epidemic occurred in May 1910, in a rural school district in Hancock Co., Iowa. Within a period of three weeks thirty cases of illness of the same general type occurred among eight of the twelve families in attendance at this school. Five cases resulting in typical definite paralysis, were undoubtedly frank poliomyelitis. The remaining twenty-five may be considered in all probability abortive (arrested) attacks of the same infection. The most common symptoms in this group were severe headache, pains in the limbs and back, stiffness of neck and spine, and nausea and constipation.

It would seem that the closer the observation in any given epidemic, the greater are the number of cases of the arrested type described. In Wickman's study of the epidemic in Sweden in 1905, he reported 157 arrested cases among 1025 cases he investigated, 15 per cent. He considered that the proportion of arrested cases was much greater than this, and was able to verify his belief in the smaller communities, where all cases could be more easily traced. He found:

	Total.	Arrested cases.	Frank cases.	Per cent.
Trastena,	49	23	26	46
Atvidaberg,	31	11	20	35
Smedjeback,	50	28	22	56

In the epidemic of 700 cases which swept the island of Nauru in January, 1910, only fifty cases had any paralysis remaining at the end of three months, and Müller reported that many others had only a slight paresis lasting two weeks or less, while many had no paralysis whatever.

In the reports received from physicians during the Wisconsin epidemic of 1908, the prevalence of light forms of the disease was often remarked. Dr. Herman Prill sent a written report of eleven cases, but added he had seen twenty-five in all, the remaining fourteen having symptoms of acute illness, but no paralysis.

Dr. A. G. Wilcox, of Solon Springs, Wis., reported four cases of definite paralysis, adding: "There have undoubtedly been several cases in this vicinity which had no doctor. A few people have been in for 'weakness' for their children; as I did not see

the children, I have no way of stating positively what the trouble was."

These cases are often unrecognized. I am reminded of the reply of a mother whom I saw in my daily round during the Eau Claire epidemic. The mother was holding a lusty boy in her arms, and to the question if he was ill, said: "No, he ain't sick, he had a high fever last night, and this morning he can't stand alone, but he ain't sick." Those fleet symptoms marked the only disturbance of the two-year-old.

Symptoms of the Arrested Type.—The symptoms of onset of poliomyelitis are the symptoms of the arrested form of the disease. These symptoms usually occur in a somewhat modified form, but they may be as severe and prolonged as a case of the paralytic type. Some symptoms are apt to be more prominent than others, and cases of the same type usually occur in groups. The arrested forms in a family which develops one or more cases of true paralysis, may all suffer from a neurasthenic hyperexcitability or languor; the members of such a group may all be attacked with nausea or vomiting, or diarrhea, or both. Meningism may mark the onset in another community. Although Wickman places some emphasis on the four different types of the arrested type of poliomyelitis, I am inclined to consider such a classification somewhat confusing. The symptoms of a general infection, some degree of gastric disturbance and meningism are present in all these cases. Constipation with a preceding diarrhea is the rule.

A change in disposition is the most common symptom; basilar headache with cervical tension, is usually present. There is a rise in temperature which is usually brief, limited to a few hours; but it has lasted into the third day. The pulse rate is increased. There is a feeling of marked languor, or one of anxiety and restlessness. Anorexia is usual, and there may be nausea and vomiting. There is also some degree of pain. This may be a myalgic pain of the back or extremities, and is associated with tenderness. The spine is usually tender its entire extent. Tremor, incoordination, an ataxia manifesting itself as an apparent clumsiness may or may not be noted. When a frank disturbance of motion is apparent, or meningitic twitchings or convulsions occur, the case does not belong to the arrested type.

The diagnosis of the arrested type of the disease is not difficult during an epidemic, when the association with frank cases is apparent. Without this association, but during the present

pandemic it would be well to regard with suspicion cases of basilar headache, with cervical tension and tender spines, which at the same time present an elevated temperature.

II. THE SPINAL MYELITIC TYPE.

Case:(17) typical, mild. Dr. A. W. Myers, Milwaukee, August 10, 1908.—D. E., three years; male (physician's son). Onset: temperature 104° F.; twitching, but no convulsions; delirium; stupor; pain; paralysis of right leg; knee-jerk absent on the affected side, normal on left; slight atrophy; recovery.

Case: typical, severe. Dr. M. W. Dvorak, La Crosse, Sept. 16, 1908.—D. H. female; two years. Onset: temperature 103° ; pain; vomiting; delirium; paralysis of both lower extremities, left upper extremity, muscles of back and neck; remains same.

The characteristic of the spinal myelitic type is the development of a flaccid motor paralysis of the muscles supplied by spinal nerves. The distribution of the paralysis of the muscles usually follows their segmental relation in the cord. The usual involvement of the lumbar enlargement, and the less frequent destructive invasion of the cervical enlargement results in the paralysis of the lower, and less commonly, of the upper extremities. As a rule the paralysis is more extensive than persistent; a regression taking place after the height of the paralysis has been attained. The severity of the onset is no certain indication of the degree of paralysis which may obtain.

The spinal myelitic type is most apt to present an aura of onset; this aura usually occurs from two days to a week before the onset and will take the form of a stumbling gait, unusual falls in a hitherto sure-footed child, and tremor, incoordination and ataxia, in the adult.

The onset is sudden, with fever and general indisposition; insufficient observation is responsible for the statement that cases of paralysis occur without preceding initial symptoms. Sometimes the attack develops in two distinct periods with a pause between, during which the patient recovers, and then suffers a relapse and the paralysis declares its presence.

The paralysis usually develops from the second to the fifth day after the onset. It may be delayed for a longer period, two, three, four and six weeks' delay having been reported. It is progressive in development. If the lower extremities are attacked, paralysis of one develops twenty-four to forty-eight hours before the other. The lower limbs are usually involved before the arms, although the reverse may occur. If the paral-

ysis is not suspected, it may have fully developed before it is discovered; this is not infrequently the case with young children, and gives rise to the statement that complete paralysis develops suddenly.(18) Romeir's paralysis of the morning.

With the progressive development of the paralysis, the symptoms of onset diminish in intensity and usually by crisis. The greatly accelerated pulse slows to near the normal, or may show a bradycardia. The febrile temperature drops to within one degree of normal. The respirations also become less frequent, unless there is an oncoming paralysis of the respiratory muscles.

The symptom groups which originate in meningeal irritation, or in invasion of sensory fiber tract may show some remission, but usually become more profound until regression of the paralysis is established. Pain, and tenderness of the spine are enhanced, and great hyperesthesia develops in the affected extremities. Delayed urination or retention occurs, due to paretic inhibition of the bladder wall; the paretic torpidity of the bowels results in coprostasis.

Considered as a whole, however, the symptoms of onset moderate to a marked degree or disappear with the oncoming of the paralysis.

Progression of the paralysis to its maximum limit and extent may occupy from two days to a week or more. There may be a paretic condition only, with quick return to normal function of the involved group of muscles; there may be paralysis of apparently severe degree involving all four extremities, and a subsequent recession of the paralysis, with no permanent damage to more than one extremity or muscle group. A recession of the paralysis is usual, but a certain number of cases show no regression, and a subsequent atrophy of the involved muscle groups occurs.

The muscle groups least involved, and those last involved usually recover first; the regression may leave but one token of paralytic attack, the ptosis of an eyelid, or the involvement of a single muscle group, leaving a wry neck or drop foot.

Distribution of Paralysis.—The distribution of the paralysis in cases of the spinal myelitic type during the Wisconsin epidemic(19) is shown in the accompanying table:

One lower extremity	26
Two lower extremities (three with sphincter involvement)	49

Two lower and one upper	6
Two lower and two upper	18
One lower and one upper	3
Arm and shoulder	3
Deltoid and shoulder	1
Sternocleidomastoid	6
Left peroneus and bladder	1
Paresis	6
"Paralyzed" (no further details)	11

Paralysis of the muscles of the back and abdomen may have been overlooked in some of these cases, but it seems probable that such paralysis if it occurred was of mild degree, and proved regressive in type. We did not note paralysis of the abdominal or erector spinæ muscles in Wisconsin, nor of the diaphragm, save in those cases which proved to be of the ascending and fatal type. Dr. Kelly, of the Washington State Board of Health, in his report of the 397 cases in that State in 1910, writes: "Among the muscles rarely attacked we may note paralysis of the neck and back . . . and of the abdominal muscles." It is certain that this exemption, if it exists, relates to certain epidemics only, and I am inclined to believe, epidemics which occur in a suburban or hygienic district. In the clinic drawn largely from the East side of Manhattan, there are numerous cases of scoliosis due to the paralysis of the erector spinæ segments, with paralysis and atrophy of the serrati, and latissimus dorsi. The lesion is usually unilateral: in twenty-four of twenty-five such cases seen at the clinic of the Hospital for Deformities and Joint Diseases, the right side was affected.

The postparalytic atrophy of these muscles of the back and one side are so extreme that the side and back cave in. The resulting distortions are various depending largely on the contraction, or overextension of the corresponding muscles of the opposite side.

Radiograms of these children show not only every degree of scoliosis, but a rotation of the bodies of vertebræ, from the pull of unopposed muscles.

In the Massachusetts epidemic of 1909, of which 613 cases were investigated, there was paralysis of the back, eighty-three times; of the abdomen thirty-seven times. In New York State, 1910, of 226 cases: the back was affected thirty-four times; the abdomen twenty times. No comment is made, however, in these

cases of extreme distortion resulting. I am inclined to attribute the extreme cases seen at the New York City Clinics, to be the result of infantile paralysis, plus the conditions of ghetto and tenement house life.

The lower limbs are most often paralyzed, and both legs are usually affected during the progression of the paralysis; the residual paralysis is usually confined to one leg. In our series of cases paralysis of both legs was reported (forty-nine cases) to be about twice as frequent as paralysis of one leg (twenty-six cases). With definite paralysis of one leg, examination of its fellow will usually demonstrate a marked exaggeration of the knee jerk which would imply some degree of involvement of the quadriceps extensor at least.

The lower limbs are affected much more often than the arms. Frost considers this ratio to be as two to one. In Wisconsin it was three to one during the acute stage. A severe case of the spinal type may present a paralysis of both legs and a spastic condition of the trunk and arms, which are further immobilized by pain during the acute stage, but the residual paralysis in these cases frequently involves the legs only. The cases presenting residual paralysis of leg or arm only would give a ratio of eight to ten of the lower segment group to one of the upper segment group.

A paralysis of any or all extremities may occur, or of any combination of these four members of the body. This paralysis is rarely total at the maximum; the toes or fingers can usually be voluntarily flexed. Regression of the paralysis usually leaves a permanent lesion of only certain muscle groups; the great quadriceps extensor and peroneal group of the legs; the shoulder and upper arm group of the arms. The flexors of the leg are rarely involved, and extensors of the arm usually escape. The atrophy which follows rapidly often brings to notice a hitherto unsuspected muscle involvement; the buttock muscles of the affected leg wither, and a quickly established scoliosis is found, due to atrophy of the hip, side and back as well as to the effort of the child to stand straight on the affected leg.

Paralysis of the extremities is more common, but less serious than paralysis of the muscles of the torso. The gravity of the condition increases as the paralysis approaches the chest muscles. Some paresis of the involuntary muscles of the bowels is indicated by the constant constipation, to which is added, infrequently, a paralysis of the abdominal musculature. The

meteorism attending paresis of the bowel pushes out the relaxed abdominal wall in huge hernias; three of these great protrusions are sometimes seen on a single case. These paralytic hernias are usually temporary, but may remain. When the paralysis is confined to one half of the abdominal wall the unopposed muscles of the other side will draw the navel away from the hernia. The abdomen may be uniformly dome-shaped, with bulging during crying or coughing.

Paresis of the bladder is frequent, resulting in retention. Paresis of the urinary sphincter is less frequent, and incontinence may be the result of distention and overflow. Control of both urinary and anal sphincter is wholly lost however, in a small number of cases.

Diaphragmatic paralysis is serious, but not of necessity fatal. It is indicated by a reversal of the abdominal respiratory excursion, which now retracts on inspiration, and protrudes the abdominal walls on expiration. When combined with paralysis of the intercostal muscles death from respiratory failure ensues. Paralysis may effect the muscles of one-half of the chest only, which will be completely immobilized while the respiratory excursion may be seen on the unparalyzed side. When the intercostals of both sides are involved the chest will remain immobile, and breathing will be purely abdominal in type.

The knee-jerk is the most reliable tendon reflex, and it exhibits a wide variation of responses. It is usually exaggerated in the preparalytic stage, and lost with oncoming of paralysis. It may wholly disappear a short time before the paralysis is manifest. It may however remain exaggerated throughout the whole course of the attack. Wickman considers this augmentation of the patellar reflex when present in the paralytic stage to be due to an involvement of the white matter (conduction paths) in the upper cord.

Spontaneous Regression.—As a rule the paralysis is more extensive than persistent. When the paralysis reaches the maximum, regression is soon established in all but extremely serious or fatal cases. This improvement may be rapid for some days or weeks. The regeneration is not so rapid but is continued over a long period of time. The regression is due to the recovered function of motor cells as congestion and pressure edema disappear. The slow and subsequent improvement is due to a regeneration of the nerve supply, with a possible taking over of function by hitherto latent groups of cells. The spontaneous

improvement in these cases is sometimes remarkable; the re-educative progression which may be achieved is marvellous. The spontaneous regression in a case of complete paralysis of all extremities may continue until the residual paralysis involves one leg or one arm only.

Dorothy P., aged four years; onset August 21, 1910. Very high fever, bad headache, "kept her hands to her head." Aug. 2, all extremities, back, shoulder and muscles of neck paralyzed. Taken to hospital and at the end of five weeks taken home but could not sit up; was put in a plaster jacket which was removed in three weeks. Dec. 25, 1910, could stand when braced and use both arms and hands. Feb. 1, 1911, Hospital for Deformities and Joint Diseases clinic; spontaneous recovery of trunk muscles. Remaining disability: paralysis of extensors and drop foot of both legs; left worse than right.

The muscle groups with a residual paralysis now show rapid atrophy; and unsuspected paralyses will now become evident as the belly of the muscle withers. The glutei and the muscles of the back and scapula are those most often overlooked. Herne-man-Johnson mentions the slow development of a wry-neck, which may not become evident in less than a year after the acute attack, and is evidenced by the traction of the head toward the unparalyzed side. The unopposed action of the healthy muscles is largely responsible for the contractures which now follow, and are therefore preventable.

III. ACUTE ASCENDING OR DESCENDING PARALYSIS (LANDRY'S).

Case of ascending type with death on fortieth day. Dr. G. H. Fellman, (20) Milwaukee, Wis.—E. F., male, eighteen months. Onset, May 26, 1908. Fever, restlessness, delirium; pain on moving limbs; temperature when first seen (after paralysis began) 100.5° F., late, thirty-eighth day, 108.5 to 110° per rectum. Rash: bright first two days. Paralysis of both lower extremities followed by partial paralysis of both arms; inability to lift head; left facial paralysis and convergent strabismus of left eye. Patellar reflexes abolished; Babinski's sign present; twelfth day, motion returned to arms; fourteenth day, motion returned to limbs; fifteenth day, paralysis of rectus subsided; eighteenth day, involvement of hypoglossal; twenty-fourth day, twitching of arms and legs; twenty-sixth day, spastic contraction of hands; thirty-seventh day, crowing spasms of larynx; thirty-eighth day, temperature 108.2° F., per rectum; respiration rapid and irregular, becoming Cheyne-Stokes in type; fortieth day, moist râles over lower lobes of lungs, and dullness over same area. Death occurred on fortieth day, at 5.30 P. M., the temperature (rectal) one hour previous being 110° F. and pulse 154. (Dr. Fellman's diagnosis was "infantile paralysis of cerebral origin.")

The paralysis in this case was of the ascending type; we are indebted to a careful observer for this first record of great dis-

turbance of the heat center as shown by a rectal temperature of 108 to 110° F. It probably occurs and is overlooked in many cases of poliomyelitis. The steady progression of the paralysis, which in this case was much prolonged, is shown by the late involvement of the cortex (spastic contractions twenty-sixth day) and final involvement of centers of respiration and heat.

The whole course of a fatal paralysis of the ascending type is less than a week in a majority of such cases, and may be more rapid.

Case of Descending Type with Death on Fourth Day.—Armstrong and Cown, (21) Seventeen cases of poliomyelitis, at St. Paul, Minn., 1909.

V. H., female, three years and nine months. Aug. 27, vomited pear; 28, vomited everything given her including water; played about, was sleepy; 8 P. M., physician called, temperature 102°; knee-jerk present, pupils reacted; Kernig absent. Gave calomel and ordered baths and ice to suck; 29, temperature 100.3°; vomited everything given her, slightly jerky, no other symptoms. 3.30 P. M., all attempts to drink choked her and liquids came out through the nostrils; with some ejection of frothy substance from mouth; 8 P. M., throat filled with saliva and air bubbles, regurgitated one-half teaspoonful of water; 9.30 P. M., temperature 100.5°; pulse good, child looked well except for paralysis of deglutition. August 30, 2. A. M. child dying, no convulsions, no other paralysis; died at 4.30 A. M.

The separation of the acute ascending (or descending) paralysis from the spinal type is wholly arbitrary, and according to Wickman such cases belong to the spinal type unless there is a (fatal) involvement of the muscles of respiration.

The paralysis in these cases makes steady progress, upward or downward from the area first involved, until paralysis of respiration closes the scene.

IV. ACUTE BULBAR-PONTINE TYPE OF POLIOMYELITIS.

Case of bulbar type with moderate cortical involvement.

Dr. Colin K. Russel, Montreal.—Thirty-eight recent cases; a study of poliomyelitis. The patient, a child of two and one-half years, could not protrude the tongue; not only was the left side of the face paralyzed, but there was oculomotor paralysis and motor paralysis of the fifth nerve, with the consequent strabismus and ptosis, and inability to close the jaws. This was later associated with a spastic paralysis of the right arm and leg., showing a spread of the lesion and the involvement of the upper motor neurons to the limbs of the opposite side of the body. The child eventually made a good recovery.

Case of bulbar type with cranial nerve involvement only.

Dr. Kelly, Bulletin Washington State Board of Health.—

W. C., male, six years; fever, headache, stiff neck, constipation; unconscious for several days; difficult breathing; inability to swallow; loss of hearing and speech for eight days; eighth day, right facial paralysis; difficult mastication. Facial and hypoglossal paralysis lasted for six weeks. Complete recovery.

In the bulbar-pontine form there is paralysis of the muscles supplied by nerves which take their origin in the medulla or pons; the cranial nerves most often involved are the facial, hypoglossal, and ocular. There may be involvement of the throat and larynx. Cases of the bulbar-pontine type may be associated with a spastic paralysis due to cortical involvement, as in the first case above given, with a lower segment paralysis; with acute respiratory paralysis and death due to invasion of the vital centers which are disposed along the floor of the fourth ventricle; or to tremor and ataxia due to interruption of the conducting fibers from the cerebellum.

Facial paralysis is the most frequent manifestation of this type; it is usually unilateral but may be bilateral. It is frequently the only manifestation of the acute disease, and in sporadic form occurs not infrequently among adults. A considerable number of cases among adults are constantly in attendance at the clinic of the New York Hospital for Deformities and Joint Diseases.

Five per cent. of the cases in the Massachusetts epidemic of 1909 had facial paralysis.

Ocular disturbances are common. There may be a transient nystagmus or diplopia. Internal squint, due to involvement of the external rectus, and divergent squint with ptosis, from paralysis of the oculomotor are often seen. There may be fixation from paralysis of all the muscles. There may be transient blindness; or optic atrophy with permanent blindness.

Transient aphasias and transient deafness, are not rarely seen in this type of poliomyelitis. Dysphagia, with salivation and regurgitation of all liquids through the nares is frequent. Dyspnea and the Cheyne-Stokes syndrome, when there is no paralysis of the chest muscles, point to alarming involvement of the pneumogastric centers.

Stephenson(22) of London reports twenty-eight cases of strabismus, of sudden onset, occurring in children under six years of age; he considers them polioencephalic in type, and says that acute focal encephalic strabismus is very apt to be confused with ordinary concomitant convergent strabismus.

V. ENCEPHALIC TYPE.

Cases of spastic paralysis with resultant contractions, but no atrophy, are frequently seen in close association with cases of the flaccid paralytic type. The association may be a communal one. It may occur in two members of the same family, and this association is not infrequently seen in one individual who presents after the acute attack, both spastic and flaccid lesions.

Spastic lesions arise from injury to the motor cortex of the cerebrum, or destructive invasion of its paths of conduction.

A spastic paralysis, however, is but one of the results of an encephalitis produced by the virus of poliomyelitis. There may be associated with the spastic paralysis, or alone; tremor, an acute ataxia, athetosis, clouded mentality or hydrocephalus.

The association of a flaccid paralysis of the extensors of one or both legs, with a spastic condition of the great toe or toes, or of the fingers of the hand of the opposite side, is seen so frequently in the clinic of the New York Hospital for Deformities as not to arouse comment.

Three cases, the first and third of which were seen at this clinic, are given:

Hosp. for Deform., Examining room, May, 1911.—M. K., four-year-old girl, of Irish-American parentage; well developed; conscious; carried in by mother. Onset ten days previous with fever and vomiting. Child spastic and rigid from head to heels; spasticity increased on handling; when placed on feet on examining table child was rigid as a bottle and could be passed back and forth between the hands as a bottle might be if tapped lightly on the neck; this action increased the spasticity until the child was standing rigidly and involuntarily on tip toes.

Armstrong and Cowern, (23) St. Paul; seventeen cases of poliomyelitis, 1909.—C. J., aged six years, female; Sept. 3, malaise, and headache; Sept. 4, feverish, drowsy, constipated; Sept. 5, 5 P. M.; first seen by physician who considered it a case of indigestion, gave calomel, and ordered citrate of potassium which was vomited. Vomited several times, told her mother her left hand hurt her and "wanted to stay shut." Sept. 6: paralysis of hand; could not extend fingers. Child was up and appeared well save for a "wobbly" gait. Feb. 19, 1910, child carries left hand in right; with effort she can extend fingers and thumb, and the fingers are in a state of semiflexion with distal joint of thumb semiflexed. This was a case of direct infection from a cousin.

Hosp. for Deform., May, 1911.—F. B., male, aged nineteen months. Well developed boy; American parents; walked and talked at fourteen months. Acute onset, April 19, 1911 (a sister also contracted the disease, but made a good recovery). High

fever; head sweating; strabismus; opisthotonus; unconscious nine days. Five weeks later, paralysis of extensors of both legs; spastic right and left great toes; fingers of both hands spastic, and hands and arms constantly employed in slow athetoid movement when awake. Constant slow vermicular motion of torso; makes no effort to sit, stand or talk.

Head hydrocephalic, circumference 18 1/4 inches; fontanels unclosed; mentality clouded, but recognizes parents; marked irritability.

Classification of Symptoms of Encephalic Type.—Modified from Reginald Miller.(24)

Polioencephalitis superior. Rolandic cortex-spastic hemiplegias (Strumpells' paralysis).

Frontal area—associated with mental defectives and morons.

Occipital area—blindness with normal eyegrounds and active pupils.

Symptoms common to all; stupor, coma, meningitic cry, bulging fontanelles.

Polioencephalitis inferior (Bulbar-pontine type—see above). Paralysis facial, oculomotor—auditory—one side only. Tremor (pontine); bulbar paralysis (vital center of medulla).

Encephalitis cerebelli—(Predominant ataxia type). Ataxia well marked or extreme; not demonstrable while patient is stuporous, evident when patient rallies and makes voluntary movement; myasthmus; scanning speech. (Clinical diagnosis confirmed twice; postmortem in one recent case and in one case of thirty years' standing.)

Encephalitis of mid-brain and connections: Acute tremor; hypertonus; excessive emotionalism. Tremor, due to the alternate action of groups of muscles and their antagonists; a slow rhythmic movement of the intention type, at the rate of about five a second. It is of the intention type, and appears only when an attempt is made to use the affected limb. Hypertonus, not a true spastic condition, but sufficient to make the movement of limbs slow, stiff and awkward.

Thalamic encephalitis: Spastic paraplegias and hemiplegias may have an associated athetosis or chorea due to lesions in the optic thalami. (See Case III, encephalic type, above.)

All types of encephalitis enumerated above may occur:

I. In epidemic form.

II. In sporadic form.

III. As congenital cases from intrauterine infection. Congenital spastic paraplegias. Mental deficiencies of all degrees

Polioencephalitis of a pure type, with no paralysis, spastic or otherwise, may occur. This class of case among male adults is almost uniformly fatal, and is rarely recognized in its relation to the epidemic disease. Such a case, confirmed by the post-mortem examination, is here given:

Harbitz and Scheel:(25) Anatomic investigation of nineteen cases of epidemic acute poliomyelitis.

Male, thirty-nine years; fever; headache, stiff neck, vomiting, some rigidity of limbs, convulsive seizures, clouded consciousness; coma, death on twelfth day; no paralysis nor paresis.

Necropsy.—Diffuse hyperemia of central nervous system; softened encephalitic foci in the right temporal lobe; and gyrus fornicatus of both sides. Inflammation extended with lessened intensity to basal ganglia, along aqueduct of Sylvius, through medulla oblongata and was even demonstrable in upper portions of cord.

Gregor and Hopper.(26) Poliomyelitis (132 cases) in Cornwall and Devon, England, 1911.

O. N. B., male; onset Aug. 28, temperature 100–101° F.; vomiting. Aug. 30, very irritable. Kernig present on both sides; fundi normal; paralysis of external recti; no other paralysis. Sept. 2, semicomatose, gradually deepening to stupor. Sept. 3, coma, died.

Predominant Acute Ataxia Type.

In the foregoing classification of cases of polioencephalitis according to their cerebral localization, it will be seen that the cases of acute ataxia are included in the subhead, cerebellar encephalitis. While it is true that some degree of ataxia may be present at the onset of any case, there is a type of case in which ataxia of an acute and extreme degree has been the predominant feature. These cases are not common, and as it has now been demonstrated that they have their origin in a cerebellar or pontine crossing lesion, there is no necessity of giving them a further classification than their proper alignment in the encephalic group.

Acute ataxia is the prominent symptom of this group, developing suddenly and associated with systemic disturbance. While the patient is in a comatose state the ataxia will be masked but becomes apparent as the patient convalesces. The ataxia is well marked and has been called a "wild ataxia" by Leonard Parsons. There can usually be found reflex extensor plantar responses. Nystagmus, scanning speech and hypertonus of muscles may be associated.

This acute ataxia was first described by Leyden in 1891; a number of cases have been reported in England (Batten). The clinical diagnosis has twice been confirmed by autopsy. An early case was reported from Germany in 1895; a case of thirty years' standing was described by Clapton (Reginal Miller).

Dr. J. T. Batte, Cincinnati.(27)—E. S. White, female, Kentuckian, twelve years; onset July 5, 1911, headache, fever, rapid pulse; movements impaired and locomotion embarrassed; August 18,

referred to Ohio Medical College Clinic. Emaciated, weak, headache, projectile vomiting. Slight internal strabismus of left eye; right side of face paralyzed, tongue protruded to right, speech inhibited; sternocleidomastoid of right side a flaccid paralysis with peculiar position of head. A distinct cerebros spasmodic gait. A provisional diagnosis of brain tumor or basilar meningitis was made, when younger sister developed symptoms of infantile paralysis, with paralysis of both hips and later the father and another sister became ill. The cerebros spasmodic ataxia of the first case persists. (Batte, *Lancet-Clinic*, Cincinnati, December 2, 1911.)

It is difficult and perhaps unnecessary to draw a sharp line between incoordination and ataxia. Both may precede the acute onset of poliomyelitis.

Frost states that incoordination may be ascribed to several possible causes:

1. Lesions of the cerebellum.
2. Lesions in the conducting tracts leading from the cerebellum.
3. Lesions of the posterior cornu of the cord affecting muscle sense.
4. Paresis—of certain groups of muscles, disturbing the balance between these and their opposing (unaffected) muscles.
5. Peripheral neuritis.

To which might be added:

6. Imperfectly developed conduction paths in the child, which are subject to disorganization from numerous causes.

As has been stated, the acute ataxia of predominant type arises from the first or second of these lesions, *i.e.*, of the cerebellum or its conducting tracts. It is associated with exaggerated (especially plantar) reflexes, transient coma, nystagmus, scanning speech, and usually terminates in recovery.

VI. MENINGITIC TYPE.

Case: meningeal type; mild.

Dr. Bowles, Elewa, Wis.—E. T., male, eight years; Sept. 25, 1908; headache; pain in neck; severe pain in back; temperature 102°; no other case in house, but several in village. Comatose for several days; no paralysis; "meningeal type, no spinal symptoms."

Severe case of meningeal type.

Hallett and Shidler; Shidler, *Pediatrics*, 1910.—"One case gave as pretty a picture of meningitis as can be imagined. The child was unconscious, back bowed, buttocks and head sustaining weight of child if placed on back, spinal column as stiff as a board, spastic paralysis of arms and legs, rotation of eyeballs, mumbling,

and groaning, arms crossed rigidly over chest, legs flexed and stiff from contraction of hamstring muscles. Temperature 104.2 pulse 140, respiration very fast and labored. Such a case required close work to differentiate. A lumbar puncture gave a clear fluid which escaped under great tension at first. The specimen centrifuged and stained showed only mononuclear lymphocytes. There were no intracellular organisms and no polymorphonuclear cells.

It is the appearance of this confusing meningeal type of poliomyelitis early in the epidemic which has so often led physicians to consider that they were facing an epidemic of cerebrospinal meningitis. The meningeal symptoms are characteristic and may predominate. A paralysis may follow which at once clears the diagnosis, but a certain percentage of the cases recover or die with no paralysis. Wickham, in his great monograph, states that clinically and by autopsy it was demonstrated that the whole course in some of these cases was that of a meningitis serosa; he would also include sporadic cases of meningitis serosa as due to poliomyelitis. The two cases given above illustrate a mild and very severe phase of this type of poliomyelitis. They conform absolutely to the classic conception of meningeal irritation; severe headache, pain in the neck and spine, retraction of the head, contractions of the spinal muscles, spasticity, and disturbed vision.

Poliomyelitis in pregnancy may take the meningitic form and simulate eclampsia with the utmost fidelity; such a case was reported by Wickman in a young woman, six months pregnant, taken acutely ill, with retracted head and spine followed by severe convulsions. Forced delivery was successfully conducted, the convulsions continued, although the patient was entirely conscious until death on the third day, when autopsy revealed typical histological lesions of acute poliomyelitis.

With the meningitic symptoms enumerated, there may be paralysis, the patient may be wholly conscious, or suffer any degree of convulsive attack, stupor, delirium or coma. The only certain means of diagnosis is by lumbar puncture, and examination of the spinal fluid.

VII. NEURAL TYPE.

In the neural type of poliomyelitis the onset is similar, but the pain is not confined to the basilar and spinal areas: Pain in the extremities assumes an agonizing character, there is

tenderness on pressure along the nerve trunks, and the clinical picture is that of an acute multiple neuritis. In some of the cases a flaccid paralysis follows.

Cases of purely neural type are seen; the pain may be very persistent, and the case a long one of many weeks. Such cases present no paralysis, and the diagnosis is very confusing unless the relationship to a case of poliomyelitis is evident. This form may be seen in adults or children, perhaps more frequently among adult women. Neuritis is such a rare disease in childhood that when it occurs, infantile paralysis must be suspected, the neuritis of diphtheria having been previously ruled out.

The purely neural type is comparatively rare; pain of a multiple neuritic character may be observed in combination with any of the foregoing types of the disease. It differs from multiple neuritis in this particular; the tenderness is somewhat more extreme in the proximal areas of the nerve trunks, while in multiple neuritis the pressure pain increases toward the periphery.

The pain, of a severe and intermittent character, is most marked along the course of the great nerve trunks. It recurs at regular intervals, is increased by handling of the extremities, or movement of the patient. It seems to recur with greater frequency in sleep, but this may be due to unconscious attempts to get away from the suffering. (A ten-year-old boy, in light delirium requested me to "take that other boy's leg out of the bed," pointing to his own.

The severity of the pain seems to be in proportion to the extent of the involvement. Paresthesias are frequent, and there may be a marked alteration of temperature sense and tactile conduction. The pain may be severe and intractable; it may disappear promptly in cases of the arrested type; it may become chronic and old cases of poliomyelitis frequently complain of an ever present sciatica.

The peripheral pain and soreness is supposed to be due to central involvement. No involvement of peripheral nerve filaments has been found postmortem in poliomyelitis. Strauss reports an infiltration of the posterior root fibers and the arachnoid covering of the spinal ganglia only. The association of herpes zoster with poliomyelitis would indicate that there may be an unrecognized form of peripheral neuritic poliomyelitis, or that herpes zoster is an expression of poliomyelitis, attacking the elderly and undernourished.

Herpes Zoster.—Herpes zoster is an acute disease the lesions of which are observed in the cutaneous distribution of one or more nerves. The eruption of herpes zoster is unilateral, the precise limitation of the eruption to one-half of the body is of great diagnostic significance (Musser). Pain is the most important subjective symptom. The pain is localized in the nerves in the distribution of which the eruption takes place. The pain may precede the eruption for several days, and persist long after the eruption subsides. The pain is severely neuralgic in character, and causes insomnia and depression.

Dr. Spiller, Associate in the neurological department of Univ. of Pennsylvania, considers it possible an herpetic type of poliomyelitis may be established, stating that much the same lesions are found in the intervertebral ganglia as in the spinal cord. Spiller. *Diagnosis of Poliomyelitis*. Pa. Med. Jour., Dec. 1911.

Sixteen cases of herpes zoster occurred coincidentally with the epidemic of poliomyelitis at Penryn, Cornwall, in the summer of 1911. (Gregor and Hopper(28)). The majority of these sixteen cases of herpes zoster occurred in elderly women. In many cases there was a severe pain and general malaise, and constipation was a marked feature. The eruption appeared on various parts of the body. Six had lesions on the neck, shoulder blades, deltoid, and pectoral muscles; four over the intercostal muscles; three over the recti and buttocks; three on the lower limbs.

Chorea.—My attention was first drawn to the possibility of chorea being an acute infectious disease by Dr. M. C. Potter, of Rochester, who observed the onset of chorea in a previously healthy boy ten years of age, while at an early summer camp. There was an acute febrile onset in this case. Dr. Potter further correlated the illness to the first exposure to the bites of mosquitos during that season.

The most frequent manifestation of chorea is the involvement of a single neuron, usually one supplying a fiber of the facial nerve, with an involuntary twitching of the muscle motivated by that fiber. Such lawless and irregular twitching of the muscle may, however, involve an extremity; one side of, or the entire body. The disease shows a tendency to a spontaneous recovery, yet more often the patient is left with an ungovernable facial spasm for life. Girls are said to be more frequently affected.

Chorea is said to be transmitted (1) by imitation; (2) by heredity.

1. The little girl who plays with a comrade who is a victim of this irritative lesion of some neuron or group of neurons, and who later develops a twitching of some muscle or group of muscles is supposed to have developed the spasm voluntarily. The idea is preposterous. She is told to desist from the practice, and in a few weeks perhaps the spasm disappears. The mother considers that her admonition controlled the supposed mimicry. If the disease is not controlled, still the mother will state that it began from imitation of another case of chorea. It is stated in a medical text-book:

"Thus one child sees another child with chorea, and, through imitation *performs* the same irregular *involuntary* movement." (Herrick).

2. Hereditary chorea is said to be a rare affection which the patient can usually trace back through several generations. This is another instance, like tuberculosis, where it is difficult to displace an infection when it has once taken a firm grip on a family.

The etiology of chorea is as yet unknown but the author considers it probable that this symptom is caused by the same organism that produces poliomyelitis. It may be that its mention here will induce observation as to its coincidental occurrence in epidemics of poliomyelitis, or even more directly in the families which have been attacked by frank cases of infantile paralysis.

VIII. RAPIDLY FATAL INSTITUTIONAL DISEASE.

For emphasis the eighth and last place (in this classification) is given to a lethal group, which may be hypothetical, but distinctly claims consideration.

Several authorities maintain that poliomyelitis is slightly or not at all contagious, basing their belief on the fact that cases seldom develop in a hospital ward where others are present. While observing that such transmission is infrequent in occurrence, it occurs to the writer in this connection that we do not as yet know the means of transmission of this disease. If such transmission should prove to be by inoculation, we will say through the agency of cimex, in a well-ordered hospital it would never occur. This premise granted it is easy to see that trouble would arise in a neglected ward.

We are also ignorant of the degree of virulence which poliomyelitis may attain in the human host; in monkeys it has attained a mortality of 100 per cent. (Flexner. *Poliomyelitis*, *Jour. A. M. A.*, Sept. 24, 1910.)

Granting that a virus (whose usual strength shows a mortality rate of 15 per cent. and a disability rate of 60 per cent.) becomes suddenly and greatly enhanced in virulence *in vitro*; grant that the usual unknown inhibition of transmission of this virus is removed (or the agent of transmission is present) would we not look for a sudden acceleration of those destructive powers which have already earned from the public the name of the Children's Plague.

Such an acute epidemic asphyxia has been manifested in the past in England, with grave and alarming results which occasioned the publication of an official Blue Book. (R. Miller: *Acute Polioencephalitis*, *The Practitioner*, London, April, 1910.) The cases tended to occur in small epidemics, in which after a few hours' illness death occurred suddenly with the signs of an acute asphyxia. The cases were supposed to be occasioned by a polioencephalomyelitis in which the vital centers in the medulla were the first to be attacked. In this regard it is pertinent to consider the large number of sudden unexplained deaths which occurred during January in the municipal shelter of Berlin, and the recent, sudden, and unexplained fatalities among young children in a Brooklyn institution.

The symptoms of the fulminating and rapidly fatal cases which occur in every epidemic of poliomyelitis may also be studied in relation to the foregoing; collapse; cold extremities; vomiting of partly digested blood; suffocation; cardiac paralysis.

Gregor and Hopper. Poliomyelitis (132 cases) in Cornwall and Devon, England, 1911, *British Medical Journal*, November 4, 1911. A. J., male; twenty-five years; perfectly healthy till time of fatal illness; no history of tubercle September 22, 1911, woke with severe frontal headache; retched; in bed till 11 A. M.; rose and went for short trip on bay; returning felt sick and vomited (not seasickness); dock, 5 P. M. too ill to walk home, but walked up steps and from cab to bedroom; 5.30 P. M. (when seen) pulse 42; feet cold; put out tongue when asked but did not speak; curled up in very lethargic state; vomited a brown grumous fluid. Became comatose in a short time and died at 8 P. M., same day. Postmortem following day; all organs healthy except brain; meninges much congested; lateral ventricles distended with fluid 5 to 6 ounces.

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25. Harbitz and Scheel. Poliomyelitis. *Journal American Med. Asso.*, October 26, 1907.
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TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of February 8, 1912.

WILLIAM SHANNON, M. D., *in the Chair.*

SECONDARY ANEMIA.

DR. CHARLES HERMANN presented this case. This patient was a baby, two years of age, whose family history was negative. The parents had one other child that was healthy. The patient had been breast fed exclusively for six months. He had had pertussis and some digestive disturbance. When he was eighteen months of age the mother noticed some enlargement of the abdomen and the child was brought to the Babies' Hospital. At the time of admission, in July, 1911, the child had marked anemia, the spleen being 6 inches below the costal margin in the axillary line, and the liver $1\frac{1}{2}$ inches below the costal margin in the mammary line. The examination of the blood showed hemoglobin, 40 per cent.; red blood-corpuscles, 2,800,000; white blood-corpuscles, 13,000. Thirty nucleated reds were found in 300 counted. Two months later there was 30 per cent. hemoglobin, 2,544,000 red blood-corpuscles, and 55 nucleated reds in 300. From this time the patient showed a distinct improvement so that when he was discharged in December, 1911, he weighed 21 pounds and 12 ounces and the spleen was only $3\frac{1}{2}$ inches below the costal margin. At this time the hemoglobin was 70 per cent.; red blood-corpuscles, 5,280,000; and only an occasional nucleated red cell. Since that time the child had been progressively improving. This disease was usually considered a form of secondary anemia. It was sometimes difficult to determine the primary cause. Syphilis, tuberculosis, and chronic digestive disturbances might be absent. On the other hand many cases of syphilis, tuberculosis and chronic digestive disturbances were not accompanied by these blood changes. In discussing such a case presented six years ago he had suggested that there was probably a congenital defect in the blood forming organs. A certain number of these cases gave a history of anemia from birth. Dr. Hermann had seen three pairs of twins with this condition and it was more common in premature infants. The fact that the anemia appeared a few months after birth did not preclude the possibility of a cause acting from birth. Infants were born with a certain

amount of reserve iron in the liver and in the case of twins and premature infants this amount would probably be less than normal. After a few months on an exclusive milk diet this reserve would be exhausted. In these cases, under normal conditions, the blood forming agents might be able to meet the demands but if an intercurrent disease attacked the child they might not be able to do so. This explained the onset after certain constitutional diseases.

SPLENOMEGALY.

DR. CHARLES HERMANN presented this case, a boy twelve years of age. The parents were healthy and he was one of eight children, all living and healthy but one that died of convulsions. The labor had been normal and the child breast-fed. He had had measles and pertussis but no manifestations of syphilis and never any chills and fever. He first came under observation at the Vanderbilt clinic in 1906, at the age of seven years. The mother said that she had noticed an enlargement of the abdomen since he was four years old. During the last six months he had had abdominal pain and epistaxis three or four months ago. Dr. James had seen the boy and diagnosed his condition as splenic anemia. The examination of the blood at this time showed hemoglobin, 75 per cent.; red blood-corpuscles, 4,390,000; white blood-corpuscles, 4000; polymorphonuclears 70 per cent.; lymphocytes, 29 per cent.; and eosinophiles, 1 per cent. The spleen extended $1\frac{1}{2}$ inch beyond the middle line and 3 inches below the level of the umbilicus. The liver 2 inches below the costal margin in the mammary line. Cervical, axillary, and inguinal nodes were palpable but not distinctly enlarged. During the last five years the blood had been examined a number of times, and the hemoglobin had been found to vary from 30 to 75 per cent., and at present was over 50 per cent.; the red blood cells from 2,560,000 to 4,600,000, and were now 4,000,000; the white blood cells from 2,400 to 6,800, and were now 4,800; the polymorphonuclears from 51 to 70 per cent.; the lymphocytes from 29 to 48 per cent. There were no abnormal changes in shape or size and the Wasserman and Von Pirquet reactions were negative. There was nothing abnormal in the urine. In June, 1909, the boy had a tooth pulled and that was followed by oozing from the gums. The following month he had abdominal pain and vomited a large quantity of blood. During the last five years there had been no marked changes in his general condition or in the size of his spleen or liver. He had gained 22 pounds, weighing at present 66 pounds. Three conditions might be considered as possibilities, splenic anemia, Banti's disease or the primary splenomegaly of Gaucher. The absence of ascites could not be positively against Banti's disease, for it was characteristic only of the third stage of that disease. However they should expect some changes in the urine and the large liver so early in the disease

would be rather unusual. The lack of other cases in the large family was against primary splenomegaly. Hemorrhage from the stomach was very unusual in this condition. After having observed the patient for five years Dr. Hermann was inclined to adhere to the original diagnosis of splenic anemia. As to the treatment, mercury, quinine and arsenic had been used without any marked effect. X-ray treatment had also been employed without any noticeable change in the size of the spleen or the general condition of the patient. If his condition became worse removal of the spleen would be advisable; a certain number of cases had shown distinct improvement following this operation.

DISCUSSION.

DR. NATHAN E. BRILL said he would confine his remarks to the second case only, because he was especially interested in that type of associated enlargement of liver and spleen. Under our present ignorance of the functions of the spleen, the whole subject of splenic enlargements, associated with or without enlargement of the liver was involved in the deepest obscurity. This was still more so involved in those enlargements which arose independently of known constitutional infections such as syphilis and tuberculosis, and independently of that peculiar disease, which in many respects resembles an infection, leukemia. Until more became known of the physiology of the spleen it was almost useless to attempt explanations of the pathology and pathogenesis of diseased conditions of that organ.

This patient, however, clinically appeared to him to present an entity, to the possibility of diagnosing which he had called attention as he had also given the name to the condition, thus honoring its discoverer, Gaucher. Dr. Brill believed that this boy was suffering with the "Gaucher type of primary splenomegaly." The pathology of this condition was well known and at the same time unique, because the spleen, the liver, the portal system, the lymph glands, and as he was the first to show, the bone marrow underwent a peculiar endothelial transformation. The proliferating endothelium showing cells whose appearances were characteristic and, as far as he knew, was not imitated by any other disease of those organs. The splenic parenchyma is arranged with alveolar spaces filled with these cells, which lie loosely therein. The cytoplasm of the cells is very abundant and therefore the cells are particularly larger, and present a glistening homogenous with a finely striated appearance. The same type cells are found in the lymph nodes and in the bone marrow, in the liver and walls of the portal vein and its radicles in this disease.

Clinically the subjects afflicted with this disease presented to his view a definite picture which differentiated it from the hodge-podge collected under the names of splenic anemia and Banti's disease.

The points of differentiation were these, the longer duration

of the disease in the Gaucher type, its unpronounced anemia of a simple chlorotic type which became marked only toward the end of the patient's life, whereas it is early and a marked feature in splenic anemia. The peculiar and definite pigmentation of those parts of the skin which are exposed, hence a peculiar yellowish brown or bronze color of the face, neck and hands; the entire absence of jaundice and ascites; the remarkable feeling of comfort and well being in these patients though the spleen and liver may reach colossal size and take up even seven-eighths of the space of the abdominal cavity. The liver is also much larger in Gaucher's disease than in splenic anemia, being almost as colossal in size as the spleen; and the presence of wedge-shaped conjunctival thickening on one or the other or both sides of the eye with the bases toward the cornea and the angles extending toward the nasal or temporal angles of the lids like pinguiculæ. He has seen these wedge-shaped conjunctival thickenings in every case of Gaucher's disease which has come under his observation, embracing a series larger than any other single observer.

Clinically the disease appeared in two forms—one a form affecting more than one member of a family though the parents are not affected, and the second in which only a solitary member of a family developed the disease. It may appear in infancy or early childhood, or be delayed in development until puberty or adolescence.

Of the thirteen cases reported up to 1908 in literature Dr. Brill furnished four. The diagnosis of these cases was made during life and so reported and was subsequently confirmed by autopsy. Since then he has seen two other cases, one of a family form, in a young man of twenty-seven years, whose sister and brother suffered with the disease, and another in a gentleman of forty-three years, who was the only one of three sisters and brothers with the disease.

The blood picture in this disease was that of a simple mild anemia of the chlorotic type, but showing a decided leukopenia.

Late in the disease, hemorrhages from the nose, gums, stomach and intestines may occur as well as ecchymoses on very slight injuries to the skin. He had noted in two patients a tendency to furunculosis; each furuncle became hemorrhagic and left on healing deeply pigmented almost black permanent patches on the skin involved.

The progress of the disease was much slower than in any form of splenic anemia, one of his cases being still alive in her forty-sixth year, though suffering from the disease since her nineteenth year, and is still active and swims and plays tennis, though her spleen and liver fill the abdomen almost completely.

If we turn now to this boy presented here by Dr. Hermann, you may see that he has a tremendously enlarged spleen, extending to below the crest of the ilium, an almost equally enlarged liver, the wedge-shaped scleral or conjunctival thickenings, of

which I have spoken, the peculiar bronzing of the face, neck and hands, the rest of the skin of the body being of a normal color, though a trifle pale. If his urine be examined no bile will be found, though occasionally there is present in some of these cases, pathological urobilin of Jaffe. The blood serum will also show an absence of bile. The thin or emaciated brownish faces in these patients present a striking and strange contrast to the full abdomen and apparently large trunks. For these reasons I do not agree with the diagnosis of the gentleman who presented this patient and would differ absolutely from him when he says that Gaucher's disease is not accompanied by hemorrhages from the mucus membranes of the body. I feel convinced we have here a patient suffering with Gaucher's disease.

DR. CHARLES HERMANN did not believe it was possible in his case to make a positive diagnosis of primary splenomegaly from the clinical manifestations, only a pathological examination would be conclusive. The blood findings were certainly not characteristic. The very slight pigmentation that was present on the nose was in no sense pathognomonic. These were eight children in the family and this child was the only one affected. Severe hemorrhage from the stomach had not been reported in any of the undoubted cases of primary splenomegaly of the Gaucher type.

FOREIGN BODY IN ESOPHAGUS.

DR. CHARLES GILMORE KERLEY reported the case of a child six years of age who swallowed a watch. The watch lodged at about the level of the cricoid cartilage. It was removed by Dr. Robert Abbe with the use of a coin catcher. A skiograph was presented showing the watch in position in the esophagus.

A CASE OF FOOD ALLERGY. IDIOSYNCRASY TO EGGS, ALMONDS, AND OATS, DUE TO ANAPHYLAXIS.

DR. OSCAR M. SCHLOSS read this paper in which he gave but a brief report of his investigations, the full report of which would be given later. The patient was at present eight years of age. His first experience with egg was when at the age of ten days he was given the white of an egg in barley water during an attack of diarrhea. There seemed to be no ill effects at this time, but when fourteen months of age he was given a soft boiled egg and immediately began to cry and to claw at his mouth. The tongue, lips and buccal tissues began to swell and reached a size much greater than normal. Large urticarial wheals appeared about the mouth and after this the child refused to eat soft boiled egg. At times the child played with egg shells and they always produced urticaria over the hands and arms. At the age of two years he was given a small quantity of white of egg partially coagulated, between slices of bread. Only a small amount was taken and almost immediately he began to gag and vomit. He became extremely ill, the lips,

tongue and inner surface of the cheeks becoming enormously swollen and the urticarial wheals appearing around the mouth. The respirations became rapid and the mental condition dull. He fell asleep but awoke after a short time to vomit several times. Finally he went to sleep again and awoke after three hours apparently well. The same phenomena occurred every time he was given egg. This toxic action was caused by food that contained small amounts of egg. Pronounced symptoms were observed after he ate cake or roll glazed with egg. Two years ago the child was given almond for the first time and the same symptoms followed this as those following the ingestion of egg. He had eaten other nuts at various times without ill effects. Oatmeal caused symptoms similar to those produced by egg but much milder. Usually urticarial wheals appeared about the mouth and on one occasion vomiting occurred.

The main problems for investigation in this case were indicated by the history. It seemed of interest to determine the constituents of the foods which were responsible for the toxic symptoms. It was found that cutaneous inoculation of the active substances by means of a v. Pirquet borer produced a distinct urticarial wheal at the site of the inoculation, which appeared in from five to fifteen minutes after the test was made. With the more active substance a wheal 1 by 2 1/2 cm. in diameter and which was elevated 1 to 5 mm. above the surrounding skin was produced. In stronger dilutions the active substance caused typical urticarial wheals by mere contact with the unbroken skin. The reaction was always immediate and always disappeared within one-half to one hour. Itching was a frequent accompaniment, usually it was present with the more pronounced reactions, and always when the urticaria was produced by the contact of the active substances with the unbroken skin. Numerous control experiments were made to show that the reaction was specific and could not occur from chemical or mechanical irritation alone. These experiments demonstrated that the cutaneous reaction was not the result of chemical or mechanical irritation, that it was caused only by certain food substances and to a marked degree only by those to which the patient had shown a pronounced idiosyncrasy. Experiments with egg, almond, and oatmeal showed that a reaction was produced by the protein constituents only. Extracts and preparations free from protein were entirely inert. The experiments showed also that proteins from the same source varied in activity, some being entirely inert.

The next problem concerned the nature of the patient's idiosyncrasy. Obviously his hypersusceptibility to the food proteins was due to one of two causes. Either he lacked some protective substance present in normal individuals, or he was sensitized in the same manner as an animal became sensitized when given a single injection of a foreign protein. A number of experiments failed to demonstrate a lack of protective sub-

stance. That the condition was due to protein sensitization or anaphylaxis was shown by the fact that it was possible to passively sensitize guinea pigs by means of the patient's blood serum. Two guinea pigs weighing about 250 grammes each were given 6 c.c. of inactivated blood serum from the patient by intraperitoneal injection. Twenty-four hours later each was given 150 mg. of ovomucoid. Both developed typical symptoms of anaphylactic shock; one died in a little over an hour and the autopsy showed the typical lung inflation. The other developed similar symptoms, was severely ill, but recovered. Control animals developed no symptoms whatever when given the same amount of inactivated normal human blood serum, followed by the same amount of ovomucoid.

The next problem from a practical standpoint was that of immunization. It seemed advisable to use a single protein for this purpose rather than any one or all of the three foods, as by this means it could be ascertained whether the patient's hypersusceptibility to the three dissimilar foods was in any way related. Ovomucoid was selected as the protein for immunization as it was one of the most active and could be prepared easily and in a state of comparative purity. Treatment was begun on October 28, by the administration of 2 mg. of ovomucoid in capsules three times a day. The dose was increased at first very gradually and then more rapidly. The progress of immunization was determined by the cutaneous reaction. About the first of December when the patient was taking 100 mg. of ovomucoid a day, the reaction began to decrease and was induced only by comparatively strong dilutions, 1-500 and stronger. On January 8, the reaction had decreased greatly and on January 11, he ate one-sixth of an egg with no ill effects. From this time foods containing egg and soft boiled eggs were fed daily. The food containing egg caused no symptoms but the patient complained that the soft boiled egg caused his mouth to sting, but this was accompanied by no objective disturbances. The cutaneous reaction to egg had practically disappeared. The protease from oats caused no reaction in dilutions as high as 1-100 and oatmeal had been eaten a number of times with no resulting symptoms. These results would seem to indicate that the idiosyncrasy to the three foods was in some way related. During the immunization the patient was in comparatively good health and beyond a fall of temperature following increased dosage, there were no symptoms referable to the administration of the ovomucoid.

DR. HEHRY KOPLIK said that so far as the clinical portion of the paper was concerned there was no doubt but that anyone who treated children knew well that many of them could not take eggs, and one should be very cautious when first giving eggs to infants under the age of one year. This age seemed to be a turning point. Eggs in some infants at the age of one year, caused vomiting and purging. Sometimes, however, the clinician thought he could overcome idiosyncrasies and give the infant an

egg diluted with soup, but the same effects resulted almost invariably. In these infants not only were eggs dangerous, but milk as well in exceptional cases; milk was often very badly borne. Dr. Koplik said that he had now three cases under his care who could not tolerate milk. In one of these he had tried milk of various kinds, but none could be taken without the development of fever, vomiting and purging and symptoms of serious import. Two children, beautiful children, could not touch milk and one of them was practically brought up without being given any milk whatever. Strange to say these children did not show the same symptoms when given the mother's milk. A point that should be recognized by all, a clinical point, was that children had idiosyncrasies toward certain forms of food. For example, oatmeal acted against many; when partaken of, children developed fever, vomiting, urticaria of a violent type; even some could not tolerate beef juice. An interesting point was brought up regarding the v. Pirquet method or reaction in some of these cases; this might show what really was to blame in many of these babies. If these observations were confirmed they would lead to very important results in the feeding of these children and it serves as a warning not to force infants or children to take the various foods which absolutely disagreed with them.

DISCUSSION.

DR. CHARLES GILMORE KERLEY said that there were many children who could not partake of milk or eggs because of some special intolerance for them. In his own experience it was the milk that gave the more trouble. Only two months ago he saw a fatal case in consultation. The mother wished to wean the infant. All the cow's milk that was given during the first twenty-four hours was vomited. Finally two ounces of it was retained until 10 o'clock in the morning when the baby went into collapse and shock, becoming for the time almost pulseless. The patient presented the appearance of the cases seen with symptoms of acute intoxication. The infant could not be made to react by the use of hot baths or warm salt solution by the colon. The child gradually became weaker and died fourteen hours after the milk that was retained had been given. There was no doubt but that frequently, the giving of milk or eggs produced grave disorders in young children. Dr. Kerley had seen cases similar to those reported by Dr. Schloss. In another case the child was given milk with a 2 per cent. fat mixture and immediately signs of collapse appeared. In many cases milk could not be given until the child was at least three years of age. If given, they showed signs of indigestion, coated tongue and other disturbances. One child he referred to could not take milk at first, was now twelve years of age and enjoyed and assimilated the milk well. Dr. Kerley called attention to the fact that idiosyncrasies existed for other substances than food proteins.

A point made by Dr. Koplik was very important, the danger of forcing patients to take food which was unfitted for them. Many times they had idiosyncrasies, for proteins not only but for other foods. Arsenic and drugs frequently produce signs of illness, such as hives. Some people could not take sugar without the production of disturbances. He reported the case of a boy who had this idiosyncrasy against sugar; he took it secretly and had hives for twenty-four to forty-eight hours. The smallest amount of sugar would bring about this condition.

DR. ROWLAND G. FREEMAN said that we are all indebted to Dr. Schloss for this remarkable presentation of egg poisoning and the method of eradicating the susceptibility to eggs. He said that it was not generally appreciated how frequently cases of susceptibility to eggs in infancy occurred. It seemed to him that about one-tenth of all babies show some degree of susceptibility. Sometimes this susceptibility was very great as in the case described by Dr. Schloss, as well as in a case that the speaker saw last spring in which a rise of temperature, general urticaria, and edema of the ears, lips, and vulva, occurred within three hours after the ingestion of egg, and quickly disappeared with evacuation of the alimentary tract. Sufficient stress has not been laid on the caution that should be exercised in first giving egg to any child. Only a small amount of the white of an egg should be given first to determine whether or not the child is susceptible to egg poisoning.

DR. FLOYD M. CRANDALL said that occasionally this same idiosyncrasy was noted in giving babies cow's milk. He referred to an instance of two babies in one family who could not take cow's milk at all without being made very sick. Both children, however, could take breast milk and were reared by means of a wet nurse.

DR. OSCAR M. SCHLOSS, closing the discussion, said that a cutaneous reaction was not always obtained in these cases. He was observing two cases of idiosyncrasy to eggs, manifested by gastrointestinal disturbances, in which there was no cutaneous reaction. In one case of hypersusceptibility to pork a cutaneous test was negative. A subcutaneous injection of pig's blood serum, however, gave rise to both a local and a general reaction. The subject of the cutaneous reaction is being investigated at present.

It is possible that the spontaneous recovery of some cases, cited by Dr. Kerley, was due to an immunity produced by taking small amounts of the active substance as an ingredient of other foods.

Certain drugs unquestionably caused disturbances similar to those caused by foods. So far as we know at present, anaphylaxis is due essentially to protein substances. Whether the drug idiosyncrasy is dependent on the same or on a closely related condition, is a subject for investigation.

ALBUMIN MILK. ITS VALUE AND INDICATIONS IN THE TREATMENT OF THE DIARRHEAS OF CHILDREN.

DR. HENRY HEIMAN read this paper in which he said that a survey of the voluminous literature on the treatment of the diarrheal diseases of children showed how little of lasting value had been accomplished in the many years of cultivation of this field of pediatric therapeutics. Every few years brought forth new therapeutic measures, which, after a fair trial, soon proved to be of limited applicability and efficacy. The time honored method of treatment by catharsis, starvation and the use of intestinal astringents in some instances brought about such a marked reduction in the resistance of the child that it readily succumbed to any of the numerous secondary infections to which it was exposed. Moreover it was not seldom that resumption of the ordinary diet, no matter how gradual, brought on a fresh attack of diarrhea. The urgent need of a mode of treatment which, while it ameliorated the gastrointestinal symptoms, at the same time conserved the strength of the patient, led the profession to great with renewed hope the announcement of Finkelstein and Meyer of the successful use of such a method. Their studies on the alimentary factors concerned in the production of intestinal fermentation showed the predominant rôle played by the carbohydrates and the salts. Decrease or removal of one or both of these elements invariably resulted in diminution of intestinal fermentation. Further studies yielded the somewhat unexpected fact that casein had a pronounced antagonistic action upon carbohydrate fermentation in the intestines. It was shown that casein being present, larger amounts of carbohydrates could be given without producing fermentation. These observations led Finkelstein and Meyer to prepare the mixture called "eiweiss milch," consisting of casein and buttermilk. The chemical analysis of this food showed the following:

	Eiweiss milch	Cow's milk
Proteids	3.00	3.00
Fats	2.50	3.50
Carbohydrates	1.50	4.50
Ash	0.50	0.70

A liter of eiweiss milk contained 370 calories. The results of Finkelstein and Meyer in the treatment of 150 cases of dyspepsia, decomposition, intoxication, and various parenteric infections were so successful that many of the German clinics soon began to use albumin milk in the treatment of gastrointestinal diseases. The writer first used albumin milk in latter part of the summer of 1910 and he continued his observations with the onset of the diarrheal season of the summer of 1911. All patients admitted to the Children's Service of Dr. Koplik at the Mount Sinai Hospital, suffering from diarrhea were given albumin milk for a period varying from three to fourteen days. From this state-

ment it was evident that the data obtained were derived from an unselected series of cases.

The original directions of Finkelstein and Meyer for the preparation of the food were as follows: A tablespoonful of Simon's essence of rennet (or two tablets of rennet) were added to one liter of milk, which was then placed in a water-bath at 42° C. for one-half hour. It was then filtered slowly by gravity without any pressure for about one hour, through cheesecloth. The coagulum was then washed twice in half a liter of water and passed through a fine sieve by means of a wooden club. Then half a liter of buttermilk was added. The writer's method of preparation was practically as described. It was found, however, that by placing cheesecloth in the sieve, the casein particles were more readily and uniformly forced through. To make a more palatable mixture, one grain tablet of saccharin was added to the liter of albumin milk. With the use of the saccharin little difficulty was found in administering the milk to children of any age. On only five out of forty-two cases was vomiting after ingestion of this food a noticeable feature.

In general the quantity of albumin milk given corresponded to that of the usual feeding mixtures prescribed for the respective age. The caloric value of the albumin milk being about one-half that of undiluted whole milk it might be readily seen that the caloric needs of the child could be covered almost as well by the albumin milk as by the customary diluted milk mixtures.

In their original paper Finkelstein and Meyer cautioned against the too early use of carbohydrates, but in their more recent paper they attributed some of their unfavorable results to unnecessary timidity in this regard. Now they advised the addition of carbohydrates in the form of malt soup or Liebig's extract of malt as soon as the quantity of milk represented one-tenth of the body weight, even though the stools had not become entirely normal. In their series of cases, maltose was added to the albumin milk from the second to the eleventh day, when proper gain in weight did not appear. The duration of the albumin milk feeding varied from two to fourteen days. In seven cases it was given from two to three days only. In three of these the diarrhea had disappeared at that time. In the other four cases the albumin milk was continued up to the time of death. Most of the German observers had continued the use of the milk from four to six weeks, but the service of the hospital being an acute one, it was found impossible to continue it for such a length of time. In no instance did a relapse occur after the cessation of albumin milk feeding, though the patients were not infrequently kept in the hospital for a week or more on various milk mixtures.

The usual procedure was to administer in the severe cases weak tea for a period of two to six hours before the albumin milk feeding was begun. No castor oil or laxative was given.

In the less severe cases albumin milk was used from the beginning. It was stopped as soon as the stools became normal.

Intestinal astringents or opium preparations were almost never employed. When indicated, stimulants, such as caffeine, camphor, and subcutaneous infusions were given.

In most of the cases a change in a character of the stools was noted in from three to five days. In nine cases most of them of the severe type the improvement in the character of the stools did not take place within five days, though ultimate improvement did take place. In four severe cases no effect on the stools was noticeable at any time.

In over one-half of the severe cases, improvement in the general condition was seen within from two to five days. In some instances the change for the better was striking.

Albumin milk, unless carbohydrate was added did not ordinarily produce a gain in weight; in most cases, however, it checked the marked losses sustained by the patient under ordinary treatment. In the present series of cases quite a number of the patients showed a gain of from four to six ounces during the period of albumin milk feeding. Loss of weight was also seen but in only two cases was it more than one-half a pound.

There were nine deaths in this series of forty-two cases, twenty of which belonged to a very severe type of the disease; this was a mortality of 21 per cent. Excluding four cases in which the albumin milk was given for three days or less, owing to the fact that the children were admitted to the hospital in a practically moribund condition, they had left five deaths or a mortality of 13 per cent. Of these forty-two cases, sixteen were under six months of age. Seven of these belonged to the severe type of the disease, and of these three died. Under albumin milk feeding these very young children seemed to do as well as the older children. In such a small series of cases statistics were not as valuable as bedside observation and impression. From the generally favorable results obtained in this series of cases and from the bedside impressions the writer felt justified in concluding that a distinct advance had been made in the therapy of the diarrheas of children. The one indication for the use of albumin milk was diarrhea, of no matter what origin or nature. Its special indication was in those cases in which marked emaciation had taken place, as a result of the prolonged withdrawal of food. When available its use should be recommended in ordinary mild cases of diarrhea. In New York it had become possible to obtain the milk already prepared thus removing the greatest obstacle to its use, the difficulty of preparing it. Mothers and nurses should be instructed to shake the bottle thoroughly to prevent the casein from plugging the nipple.

DISCUSSION.

DR. JOHN LOVETT MORSE, Boston, said he hardly knew what he could add in regard to albumin-milk. He believed that

some of the diarrheas in infancy were due to bacteria, some of which thrived on proteids, others on carbohydrates, some to chemical disturbances in the intestine; others to abnormalities in the food. It was hard to see, therefore, how one and the same mixture could relieve the symptoms which were due in one instance to bacteria which thrived on proteids, in another to bacteria which thrived on carbohydrates, and in another to chemical action on the intestine. Finkelstein and Meyer claim good results from "Eiweiss-milch" in all sorts of conditions and when others report unfavorable results with it allege that the food is not properly used. With regard to the albumin-milk, Dr. Morse said he had tried to find a rational explanation for the mixture. If the condition present in the infant was due to an organism which thrived on carbohydrates it was easy to see that if that infant was fed on proteids the growth of that organism would be discouraged. The addition of lactic acid to the food in the buttermilk would, however, tend to neutralize its action. If the condition was due to an organism which thrived on proteids, the withdrawal of sugar and the addition of casein would, on the other hand, favor their growth. If the diarrhea was due to some lesion of the intestinal wall itself, probably caused by the fermentation of the sugar, with symptoms due to the absorption of sugar and salts, it was plain that taking away the sugar and salts from the food would result in good. Here again, however, the lactic acid in the mixture should do harm by its irritant action on the intestinal wall. The rationale of this food seems, therefore, very obscure. In the latter class of cases the withdrawal of the sugar and salts and the introduction of a large amount of proteid, freed of its salts, in the form of precipitated casein seems very sound. In these cases, after the intestinal wall has returned to the normal condition, the addition of a rapidly absorbable sugar, such as maltose or dextrin-maltose, to bring up the caloric value of the food is desirable. Dr. Morse said that he had used this method of treatment in a small series of cases. The Walker-Gordon Laboratory had prepared for him mixtures of cream, water and precipitated casein, made according to Finkelstein and Meyer's method, which contained very little lactose and salts, and which could be varied to suit the individual infant. In this way the addition of lactic acid in the buttermilk was avoided. When the acute symptoms were over and the stools had returned to the normal, he added a preparation of dextrin-maltose in order to get the required caloric value. This was a very useful method in his opinion and a definite addition to the methods of feeding. The great difficulty, however, was in determining in just what class of cases to use this treatment and when it would be most useful. In a general way it might be stated that it was useful in those cases in which there were numerous watery, light green stools, which irritated the buttocks. The stools in these cases often contained mucus also. Some of these cases had fever;

others did not. These were the acute cases. In the chronic cases, the same evidences of fermentation were present but to a lesser degree.

DR. FRITZ BANCKER TALBOT said that he had seen sixty babies in a ward in which the majority of them had bacterial examinations of the stools, and the findings were quite remarkable. They tried the modified food which was intended to meet the biological needs of the bacteria. When they had a fermentative organism to deal with they gave a food that was high in proteid but low in carbohydrates, because these organisms required carbohydrates to grow in. On the other hand when there was a tremendous amount of proteolytes present, they gave food rich in carbohydrates. The use of the albumin-milk seemed comparable to what was found in a new chemical compound. He could not conceive how this albumin-milk was of such value when one could not differentiate the acute infections, typhoid fever, and many other diseases. They had seen babies clinically which had typical symptoms of acute intestinal intoxication; and had living bacilli in the blood. How albumin-milk could touch these organisms in the blood of these babies he could not conceive.

With regard to the use of protein milk Dr. L. E. Le Fetra began to use this in the Babies' Hospital in 1910. These infants had ordinary diarrheas with stools containing blood and mucus. In these stools the Shiga organism was found. With Dr. Wilcox, at Bellevue Hospital, they had tabulated twenty-one cases that they had personally seen. There were in the hospital ward from June until the present time sixty-two cases and all were treated with the albumin-milk. There were among them twenty-one cases of severe diarrhea, many of them having stools containing blood and mucus. These babies were placed upon albumin-milk even when they had fever. All of these cases, with the exception of three improved. Of these three two died and the other patient was taken home. In the total series there were four deaths. They were given the protein milk from two to ten days. It was then decided not to keep the babies on this feeding any longer, unless they gained in weight. The main feature in the addition of albumin-milk in severe diarrheas was that the loss in weight of these infants was less during the active period of the disease and the stools returned more quickly to the normal than under any other method of treatment. He believed that all sorts of diarrhea, especially the severe forms of dysenteric diarrheas, were much benefited by the use of the albumin-milk.

DR. CHARLES GILMORE KERLEY stated he did not consider the mortality in Dr. Heiman's cases at all low and further suggested that the mortality records of the acute intestinal diseases of 1911 should not be used to establish the value of a means of treatment. In twenty-four years there had not been so few infants sick with intestinal disease. There was a very small death rate all over the country as well as in New York City. The credit for this low mortality has been claimed by the Health Department,

by various private charitable children's organizations, by the Milk Committee and others. He did not discredit the work and the good accomplished by various organizations, but the low mortality of last summer was not entirely due to such efforts and he wondered how these organizations would square themselves with the public at some later time when the mortality would be much higher.

The morbidity and mortality in severe diarrhea is not comparable in this country with that of the Continent, for the reason that we are working under entirely different climatic conditions. The pediatricists of Berlin, for example, who had been quoted, would find quite another condition to deal with in New York during the summer months than obtains in their city. They would have heat, humidity and over-crowding to a degree that bears no comparison to their own city. The use of Eiweiss milch or albumen milk had been used by him in a large number of cases in private and in hospital work. It was not a success in young babies but in older children with acute intestinal disease, it furnished a means of nourishment which the child could assimilate much easier than cow's milk could be given. After a day or two on a thin gruel, diluted eiweiss milch could be given to excellent advantage and its use continued for a week or more until freer feeding could be instituted.

DR. HENRY DWIGHT CHAPIN had used Finkelstein's method in the treatment of some diarrheas in children for two years and he thought it had a restricted value in certain cases. He agreed with Dr. Morse in what he had stated, so many of these diarrheas were due to so very different causes. If a high protein was required it should be split up in such a form that it could be easily assimilated; he thought that any benefit from Finkelstein's feeding came from this factor as it was the *form* of proteid that they gave in the milk that rendered it digestible. Maltose was the form of sugar he added to casein milk; it was more quickly assimilated and absorbed.

Dr. Chapin believed that the mortality given by Dr. Heiman was rather high, and he was interested to know how his mortality compared with the mortality under the old treatment. Dr. Chapin believed that this method of treatment had a restricted value in certain types and particularly in the dysenteric forms of diarrheas. The method employed split up finely the casein which aided its digestion and assimilation.

DR. HENRY KOPLIK said that we should give Finkelstein and Meyer credit for working out a way of feeding these children with diarrheas according to their own ideas, especially in regard to certain forms of these diarrheas. There were certain forms of milk detrimental to babies when they were sick. Finkelstein argued that whey was deleterious to babies when they were ill; he also argued that casein in the milk was absolutely innocuous and rarely did harm; he also argued that it was dangerous to feed a baby on the high percentages of fat. He, therefore, constructed

a food that was as free from fat, free from whey, but as rich in casein as he could possibly make it. He elaborated his ideas in regard to the feeding of these babies with diarrheas, especially those with autointoxication and decomposition of the intestinal contents which resulted in this intoxication. He fitted the food to each case. The food was rather difficult to make. Finkelstein was right in stating that some of the younger babies would and others could not take it. This food, it should be remembered, was not always available in private practice. The mothers could not always make it because it was so difficult to prepare. However, in the hospitals, this method of feeding could be readily carried out. Finkelstein did not advocate the use of this prepared milk in every case; so far as the cases were concerned, he did not see the very severe cases of intoxication and decomposition in Berlin that were seen in New York. The cases in Berlin were of much milder type than here. Many of the cases admitted to the hospitals in New York were the marantic septic cases and it was impossible to save them with any form of treatment or feeding. Dr. Koplik said that he was not especially impressed with the results obtained from the use of Eiweiss milk. The difficulty of its preparation was so great that it led him to exclude it in the treatment of these diarrheas and intestinal disturbances in private practice. He was not yet willing to relinquish the older methods which had proved of value in his practice.

Finkelstein found this preparation of milk could be used in babies of three months of age. There had been many other methods of feeding that had been as successful as his in older infants. There were some babies that could not take other foods but could take the Finkelstein preparation. Dr. Koplik said that he had had several instances in which the new born with intestinal decomposition seemed to be harmed by every food used. In these he had tried the Eiweiss milk but it did not seem to be sufficient to sustain the infants. There was no food yet invented or placed at our disposal that would save a certain class of cases. It was not the food that cured but the disease that killed these babies.

Dr. Henry Heiman said that his cases were not selected. There were forty-two cases of diarrhea, especially of the catarrhal form, with blood and mucus in the stools, and he knew of no treatment which touched these cases and produced the desired results. Personally he believed the disease was a self-limited one like typhoid fever, lasting about ten days or two or three weeks. Of course a great thing of importance was the administration of the food. He did not believe there was any food which would give the babies so many calories as Eiweiss milk; this saved the weight and strength of the infants, getting them in better condition so that the recovery would be more prompt and quicker. Of more importance was the feeding in these cases, not the drugging.

REVIEW.

THE ACCESSORY SINUSES OF THE NOSE IN CHILDREN. By DR. A. ONODI, Director of the University Clinic for Diseases of the Nose and Throat in Budapest. With a preface by DR. W. WALDEYER, Director of the Anatomical Institute of the University of Berlin. Translated by CARL PARUSNITZ, M. D., M. R. C. S., L. R. C. P. Head of the Hydrophobia Department of the Hygienic Institute, University of Breslau, late Assistant Bacteriologist to the Metropolitan Asylums Board, London. William Wood & Company, New York, 1911.

It was formerly considered that the accessory sinuses were infrequently, if ever, diseased in infants and young children. Recently, however, an increasing number of cases have been reported which tend to show that the old idea is incorrect. Onodi remarks that it should be regarded as an established fact that when children suffer from repeated attacks of acute cold in the head, some of the accessory sinuses are also affected, and that as a rule infectious diseases attack the partially developed sinuses. The infrequency with which disease of the accessory sinuses has been reported in infants and young children is due to a great extent to the fact that the diagnosis is extremely difficult. For this reason cases are more often found in post-mortem reports than in clinical histories.

The statistics of Harke are cited which show that out of sixty-two autopsies on children in which the sinuses were examined, they were diseased in fifty-two cases in children between nine months and fifteen years of age. Other postmortem statistics of similar significance are given.

A number of cases are cited in which the diagnosis was made and the disease treated by operation. The maxillary antrum is the cavity where diseased conditions have been observed most often, disease of the sphenoidal sinus is rare in children, while most cases of ethmoidal disease have occurred in connection with disease of the frontal sinus and maxillary antrum.

Of the diagnostic methods, Onodi places most dependence on the rhinoscopic examination. Of next importance is the skiagraph. Transillumination may be of value in certain cases but as a rule is not nearly so satisfactory as in adults. The clinical signs are of very great importance.

Professor Onodi's book contains accurate measurements of the sinuses at different ages, a consideration of the practical importance of sinus disease in infants and children with a review of reported cases, and a great number of plates of sections showing these cavities at different ages. A number of beautiful x-ray pictures are also given.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Quantitative Analysis of Human and of Cows' Milk.—A. V. Meigs and H. L. Marsh (*Med. Rec.*, 1911, lxxx, 1309) say that no analysis either of human or cows' milk has heretofore been made in which the various constituents were determined gravimetrically—each one isolated from a single sample and weighed separately and the separate weights when added together shown to be equal to the weight of the original sample. The junior author has spent two years in making such analyses, the technic of which he describes. By these methods the following results were obtained:

	Cow's Milk per cent.		Human Milk per cent.
Water.....	88.279		87.569
Fat.....	3.032		3.087
Protein.....	2.942		1.481
Lactose.....	4.482	} 5.085	6.574
Extractives.....	0.603		1.000
Ash.....	0.733		0.252
<hr/>			
Total.....	100.071		99.963
Experimental Error.....	0.071		0.037
<hr/>			
	100.000		100.000

These results seem to prove the essential correctness of the conclusion reached by the senior author from his former analyses, that the amount of protein in human milk is always small, only about one per cent., and to confirm also the conclusion that human milk does not change very greatly during the course of lactation. The milk of a woman whose baby is six months old does not seem to be materially different from that of a woman whose baby is one month old. It would seem that in the artificial feeding of infants their principal food, which in civilized countries is made in imitation of human milk, should not be increased in strength from week to week and from month to month, as is commonly taught, but should be given in the same strength but in increased quantities during the first few months of life. Most common cows give small percentages of fat, and there are a great many more common than there are high-grade butter cows. The amount of fat, therefore, is perhaps little if

any higher in average cows' than in human milk. The differences between cows' and human milk that are of importance are those of the percentages of protein and lactose. In human milk the protein is much lower, and the lactose much higher than in cows' milk.

Spasmus Nutans.—*Spasmus nutans* is the name given to a syndrome which appears in early infancy, usually between the third and fifteenth months, consisting of a nodding of the head forward and backward, or a shaking of the head from side to side, with nystagmus of one or both eyes. It has also been called head-nodding with nystagmus, head-shaking, *jactatio capitis nocturna*, gyrospasm, coördinated movements, etc. J. Thomson, in 1900, called it a functional coördination neurosis of a harmless nature which affects young infants and has a short, well-defined clinical course. He reported thirty-five cases, and laid especial stress upon three main etiologic factors—namely, the age of the patients, usually between four and twelve months, the absence of light in their surroundings, and the presence of rachitis. H. K. Hill (*Arch. Pediatrics*, 1911, xxviii, 974) gives the histories of four cases and one doubtful case. Three of these four cases substantiate the three causative factors upon which Thomson lays special emphasis.

Catarrhal Laryngitis Requiring Intubation.—J. T. Ullom (*Arch. Pediatrics*, 1911, xxviii, 983) records a case of catarrhal laryngitis requiring intubation. This caused immediate relief and recovery was uneventful. Simple laryngitis demanding intubation is a variety of which the writer has been able to find but few reported cases; but he feels sure of the diagnosis, for the child was very carefully guarded from any infection and came into contact with no other children; there was never at any time any membrane, either on the tonsils, the pharyngeal wall or in the nose, the child was not prostrated to the extent usually seen in diphtheria; there was rather a high temperature and the pulse, though high, was never weak; and bacteriologic examination of the intubation tube showed *micrococcus catarrhalis* and *bacillus subtilis*, but no Klebs-Loeffler microorganisms. In diphtheria the child is ill for a day or two before there begins to be croup, and, of course, in the majority of cases, there is membrane on the tonsils or on the pharyngeal wall; the child is markedly prostrated and the pulse is rapid and weak, while the temperature is apt to be low; there is a history of exposure; primary diphtheria of the larynx is rare. The writer feels that one should not hesitate to do intubation in any case of croup if the symptoms are progressing unfavorably. If this fails to relieve the symptoms we can turn to tracheotomy, using the long canula, as did Jackson, if the short one does not help, finally doing the resection of the thymus if pressure by that gland can be demonstrated.

Typhoid Fever in Nurslings.—M. Brelet (*Gaz. des hôp.*, Dec. 14, 1911) says that the rarity of typhoid fever in young children is

more apparent than real. It is due to the irregularity of the disease in infants and the faulty diagnosis resulting from this. Direct contact and infection may occur in an infant who is nursing a mother ill with typhoid, or infection may come from a servant who is working about the house. It is exceptional during the first six months; it becomes more frequent as the child grows older, and is not rare in the second year when the child is no longer nursed. Ulceration of the Peyer's patches and solitary follicles is generally absent, but colitis and enteritis are present and severe in form, and the mesenteric glands are enlarged and the spleen increased in size. The diagnosis is made by the bacteriological examination and the Widal test. The symptoms are vague; in case of typhoid in a pregnant mother the infant is infected and dies in utero, or survives four to fifteen days only. There are continuous fever, diarrhea, and convulsions, purpura, hemorrhages from the bowel, and icterus. Rose spots are often absent. The disease begins insidiously with digestive troubles. There may be a subacute gastroenteritis, severe meningitic symptoms, or a bronchopneumonic syndrome. Rarely is there a typical typhoid fever. The prognosis is always extremely grave in infants. Sudden death may occur. The treatment consists of tepid baths, calomel in small doses, water diet, rice water, vegetable bouillon, etc. If the infant is at the breast, nursing should be continued.

Sero-diagnosis of Hereditary Syphilis in Infants.—Charles Leroux and Raoul Labbé (*Arch. de méd. des enf.*, Dec. 1911) have made a systematic sero-diagnostic examination of atrophic infants, including children with rachitis and with craniotabes which did not show clear evidences of heredosyphilis, and in many cases found syphilis present in the parents and other children. Cases of abortive or unknown syphilis are very frequent and any practitioner by looking for them will find many dystrophies, inherited predispositions, and nutritional troubles that result from family syphilis. Hereditary syphilis is much more frequently the cause than is tuberculosis or alcohol. Sero-diagnosis was made in 300 cases in the dispensary, and here the condition was found present in the mothers and children, while in many cases the fathers would not submit themselves to sero-diagnosis or answer the questions put to them. A single sero-diagnosis is not sufficient to establish the diagnosis, but a series of reactions must be made by the same person. The study of sero-diagnosis is much more complex in hereditary than in acquired syphilis. The syphilis is in almost all cases derived from the father, who infects the mother directly, or indirectly through the child. Every mother who bears an infected child is already infected and the child cannot communicate the disease to her. In general the syphilis of the child comes from both parents, but the father is the one who brought it into the family. The sero-diagnosis practiced by the same persons in the same laboratory will be constant in 77 per cent. of the cases tested.

A positive reaction makes the diagnosis certain; a negative one does not positively exclude it; the results of sero-diagnosis must be interpreted and clinical facts should be the first criterion. Sero-diagnosis renders the greatest service in the study of the heredosyphilis in infants; to have the greatest value it must be supplemented by a study of the whole family of the patient with the same test; otherwise many cases of latent parasyphilis will be ignored.

In early syphilis of hereditary origin a positive reaction will be found in 66.6 per cent. of all cases tested. The proportion of positive reactions will vary with the nature of the lesions present, it being more often present in cutaneous lesions. In late hereditary syphilis it is positive in 85 per cent. of tests. In the latent form, generally previously treated, but 11 per cent. of positive tests are given. Doubtful cases without positive symptoms give only 2 per cent. of positive tests. That is, in secondary syphilis the test is rarely negative; in tertiary it is generally positive; in parasyphilis it is generally negative; in latent syphilis without manifestations it varies; in healthy infants from syphilitic families, who have never had any symptoms, it is always negative. Sero-diagnosis is absolutely necessary to detect many cases of latent or concealed syphilis. Family syphilis is generally not known to the mother until sero-diagnosis has shown its presence. Fathers of heredosyphilitics give 42.1 per cent. of positive results; mothers of these children give 71.33 per cent. of positive reactions. Maternal latent syphilis is generally virulent because never treated; it is more often a conceptional syphilis than one acquired directly from the father. Among the laboring classes syphilis comes from the father who marries without having had treatment. The syphilis received by the mother has the greatest effect on the child. Maternal syphilis when active generally gives an infected child, but some children are born healthy. Paternal syphilis gives parasyphilitic manifestations. When applied to the entire family sero-diagnosis shows that active syphilis in mother and father always gives infected children; latent syphilis in both parents gives healthy parasyphilitic, or dystrophic children; syphilis latent in father and active in mother gives active syphilis in the child; the reverse condition gives latent or parasyphilis. The father alone cannot infect the child if the mother is not infected. The mother regulates the sort of manifestations. Treatment does not much influence the reaction.

Household Syphilis.—J. A. Nixon (*Bristol Med. Chir. Jour.*, 1911, xxix, 301) says that the transmission of syphilis by other means than sexual intercourse is probably commoner than we are wont to suppose. Syphilis spreading in the home by nonvenereal contagion is what has been called syphilis economica or syphilis of the household. It is from the recognition of acquired syphilis in children that the spread of syphilis in the family is most commonly detected. As a rule adults are rightly or wrongly as-

sumed to have been infected by venereal contact, and some practitioners regard acquired syphilis in children as being commonly the result of a criminal assault. Syphilis economica is the true explanation of no small proportion of cases occurring in children, and extragenital chancres about the mouth in adults, as well as in children, are more often than not due to infection from food utensils; especially is this the case when the primary sore is situated on the tongue or tonsil.

Nervous Vomiting in Childhood.—E. B. Smith (*Lancet*, Dec. 23, 1911) calls attention to a type of nervous vomiting in children, of which he briefly cites a number of cases. The principle features are painless, effortless vomiting, occurring directly after meals, without alteration in the general health, and having its origin in children of nervous habits or inheritance. The child with chronic intestinal dyspepsia, or mucous disease, generally wastes, has epigastric pains and other symptoms, but rarely vomits. In cerebral tumor there may be effortless, painless vomiting, but it has no direct relation to meals; headache is usually persistent and severe, and later there will be optic neuritis, and perhaps localizing symptoms. The regular and daily nature of the sickness easily distinguishes it from that large group of cases of cyclical or periodic vomiting which are dependent on sundry autointoxications or are manifestations in the child of migraine. Vomiting due to any intra-abdominal lesion should be easily recognized by a careful examination. Treatment resolves itself into an elimination of all causes that may aggravate the underlying nervous instability. Removal from unsuitable home surroundings and the application of a little firm moral control will often effect a cure. In obstinate cases the same treatment as is applicable to lienteric diarrhea—small doses of arsenic and opium given just before meals—has in the author's experience always proved immediately efficacious.

Diagnosis and Treatment of Diphtheria.—A. Levinson (*Med. Rec.*, Jan. 6, 1912) says that besides the laboratory diagnosis of diphtheria there are several clinical points that hold good in most cases and that help in establishing the diagnosis of the disease. A diphtheria case gives a very characteristic odor like that of feces which one can easily detect at a distance of 2 feet. The odor is most pronounced in nasal cases and less so in tonsillar, but is present in all cases. Any case of sore throat with a temperature higher than 101.5° can safely be put down as a case of tonsillitis. No case of diphtheria runs up a temperature above 101.5° . A very severe case, especially if it is a nasal one, shows hardly any rise in temperature, most nasal cases having but 99° . It frequently happens that the administration of antitoxin raises the temperature to about 102° or more, but this disappears in a few hours. On the average the temperature in diphtheria is as follows: tonsillar, 101° ; pharyngeal, 101.5° ; nasal and laryngeal, 99° . Though no positive diagnosis can be made on the presence of a membrane, it can be taken as one of the best clinical

diagnostic points in diphtheria. When a membrane appears on the tonsils, uvula, or posterior nares, one can safely diagnose the case as one of diphtheria. The absence of a membrane does not exclude diphtheria but its presence speaks for it. However, if caustics have been applied to the tonsils they present an appearance of a diphtheritic membrane. Care should also be exercised to see that the tonsils have not been removed two or three days previous to the examination. Cases sometimes show what looks very much like a pharyngeal or laryngeal membrane, but on close examination it proves to be an ulcer of some kind, tuberculous, cancerous, or syphilitic. If retraction of the epigastric region is present the case may safely be diagnosed as one of laryngeal diphtheria, and antitoxin should be administered immediately. All nasal discharges in children should be suspected as due to diphtheria. The writer's remarks are based on a study of 400 cases. Regarding treatment he says that a prophylactic dose of antitoxin should not be less than 5,000 units. Curative doses in tonsillar diphtheria should be not less than 10,000 units. Curative doses in nasal or laryngeal cases should be not less than 25,000 units.

Histopathology of the Preparalytic Stage of Acute Anterior Poliomyelitis.—A. R. Allen (*Penn. Med. Jour.*, 1911, xv, 169) obtained the material for study by injecting virus of this disease into the brains of monkeys. His preparations from the cervical and lumbar enlargements show all stages of motor nerve-cell disintegration. One of the early pictures in this degeneration is a tendency for the cytoplasm to stain homogeneously. The tigroid substance becomes finely granular and evenly dispersed and later disappears. The eccentric placing of the nucleus is not a frequent finding but flattening and deformity of contour are common. A few groups of cells were found in which there was homogeneous staining of cytoplasm, enlargement of nucleus with disappearance of nucleolus and a very marked, highly refractive nuclear periphery. The writer confirms Strauss' observation that disappearance of the neuro-fibrils occurs early. In a number of instances a group of anterior cornual nerve cells showed normal neurofibrillar structure when all the other groups in the anterior horn had lost their neurofibrils. The pictures of neuronophagia found correspond to the descriptions of others. In serial sections it was possible in almost every case to trace a blood-vessel to each focus of disease. In only a few instances were Fettkörnchenzellen found. The writer was not able to mark any distinction between the perivascular infiltration of veins and arteries, such as has been described by some and denied by others.

Some observers mention the fact that the small round-cell infiltration of the pia, completely surrounds the cord in many cases in the lumbosacral region but is inconspicuous in the cervical enlargement, and when present is confined chiefly to the anterior aspect. This was precisely what was found in the monkeys

examined. In no section examined were any free hemorrhagic foci, minute or otherwise, found. The gross distention of blood vessels and the areas of marked edema were of course of frequent occurrence. The posterior ganglia and roots showed no marked peculiarity. In one posterior root a varicose and swollen condition of the medullary sheaths of a few nerve fibers was noted, but this has been remarked before by others.

Diagnosis of Tuberculosis in Children by Examination for the Bacillus.—P. Nobécourt (*Ann. de méd. et Chir. inf.*, Dec., 1911) gives the results of his studies with reference to the tests for the bacillus of tuberculosis in affections of the joints, bones, tendons, and serous cavities. He says that in the ordinary forms of tuberculosis of the bones, tendons, and joints the presence of the tubercle bacillus is easily shown by tests and inoculation experiments. It may be of use in recognizing atypical forms of tuberculosis and in differentiating this from other inflammatory agents. In effusion into the pleura and peritoneum the examination of the fluid for the tubercle bacillus is of great value. In the cerebrospinal fluid positive results can generally be obtained and it should be examined whenever rapid diagnosis is important. In the sputum of children who are old enough to expectorate, the results are the same as in adults. In those who are too young the material removed from the stomach by lavage may be tested, or the intestinal contents may be examined if there are no symptoms of intestinal ulceration.

The Relationship of Streptococci to Scarlet Fever (*Zeitsch. f. Kinderhk.*, 1911, iii, 28).—Schleimer found streptococci in the blood of sixty out of 108 cases of scarlatina studied (55 per cent.). Thirty-one per cent. of the cases with positive blood cultures developed complications. Complications occurred in 35 per cent. of the cases with negative blood cultures. These results indicated that the presence of streptococci in the blood was not necessarily associated with complications. The writer also demonstrated the presence of antibodies to streptococci in the blood by means of agglutination, compliment fixation and bactericidal tests. Schleimer does not consider that these results prove that streptococci have an etiological relationship to scarlet fever. On the other hand there is not sufficient evidence to show that they are merely the result of secondary infection.

Pyloric Stenosis in Older Children with Report of a Case of Pyloric Spasm ending Fatally (*Amer. Jour. of Dis. of Children*, 1911, ii, 407).—Graham reports a case of pyloric spasm in a child of six and one-half years. The patient suffered from persistent vomiting; the stomach was greatly dilated and x-ray examination showed that food did not pass the pylorus. The post-mortem examination showed that there was no organic stricture. Graham believes that pyloric spasm is much more prevalent in older children than is commonly supposed.

The Influence of High Temperatures on Gastric Secretion

(*Jahrb. f. Kinderhk.*, 1911, lxxiv, 697).—In experiments on young dogs Salle found that high temperatures were capable of causing a great loss of weight, fever, vomiting and diarrhea. The investigation of the gastric secretion showed a diminution in the amount of gastric juice, a decrease of ferment activity, a lessened acidity of the gastric juice, a decrease and finally a total absence of free hydrochloric acid. After a consideration of the various factors concerned Salle concludes that the relationship of high summer temperatures to the etiology of infantile diarrheas is not direct. Through its depressing action on the gastric and pancreatic secretions, heat tends to lower the tolerance for food and increases the tendency to nutritional disorders. The quantity of food should be reduced in hot weather and owing to the relationship of the digestion to the water content of the body, water should be given in large amounts.

The Hard Curds in Infants' Stools.—During the past few years the hard curds sometimes present in the stools of infants fed on cow's milk have been the subject of a number of interesting contributions. Previous to this time, these hard whitish or yellowish masses were supposed to consist mainly of casein which had escaped digestion. Mainly on the basis of metabolism experiments which demonstrated the ease with which infants can digest the casein of cow's milk, Czerny and Keller concluded that these curds were not casein at all but consisted of soaps or fat. Later, Southworth and Schloss, Talbot, and Selter showed by chemical analysis that although these masses contained varying quantities of fat derivatives (neutral fat, fatty acids or soaps), they also contained a considerable amount of protein which was apparently casein. Opposed to this view were Meyer and Leopold (voicing the opinion of the Finklestein School). They claimed that whatever protein was present in these curds was derived from the intestinal secretion and not from the milk ingested. This point was finally settled by the experiments of Talbot, who demonstrated by the precipitine test that the hard curds did contain casein. Other investigators confirmed these results by means of the anaphylactic test. From the results of chemical analyses and metabolism experiments, Courtney (*American Jour. Dis. Children*, 1912, iii, 1) concludes as follows: 1. The hard or casein curds represent remnants of food, principally of protein nature, that have escaped digestion. 2. The exact mechanism of their formation as yet cannot be ascertained and they should be regarded as a peculiarity appearing in course of imperfect conditions of digestion. 3. The curds are not pathognomonic of any definite pathologic condition. 4. The loss of food occasioned by their formation and the impairment of general nutrition resulting from it is insignificant. 5. In attempting to correct the state of digestion one should be guided by the general rules of infant feeding, paying only secondary attention to the appearance or disappearance of curds from the stools.

The Physical Evidence of the Thymus (Basch and Rohn, *Amer. Jour. Child. Dis.*, 1912, iii, 82).—Combining an exact percussion of the mediastinal area, which is done with a new percussion instrument, with auscultatory percussion and friction of this area, it was possible for the writers to obtain a more exact estimate of the size and condition of the thymus than has hitherto been the rule. The normal area of thymic dullness is rhomboid in form and extends from the jugular down to the second or third rib. The lateral borders are confined to the sternal and parasternal lines.

Thymic Asthma and Thymic Death in Children.—Ssokolow (*Arch. f. Kinderhk.*, 1912, lvii, 1) has made a careful study of the thymus gland at different ages, of published cases of thymic disease, and of the evidence concerning the relationship of this organ to certain cases of asthma and sudden death. He considers that under normal conditions there is a growth of the thymus gland during extrauterine life. The growth is most rapid up to the sixth year and more gradual between this time and the twelfth to the fourteenth year. From this time the glandular tissue begins to be replaced by fat and connective tissue. Although the gland has a definite weight even to old age, it loses its physiological significance. The size of the thymus gland is generally in direct ratio to the nutritional condition of the child. The removal of the thymus in animals causes an increase in the number of red blood cells, no changes in the white cells, and no other important changes in the organism. The thymus is in functional relationship with other glands of internal secretion; spleen, thyroid and testicle. It has a close relationship to the thyroid. The injection or squeezing of thymus juice into the circulation of animals is capable of causing death with a slowing of the pulse and a fall of blood pressure. Ssokolow believes that feeding the thymus has a therapeutic worth and in many cases can replace the thyroid for this purpose. He believes that the thymus has a special significance in the growing organism and that its internal secretion is important in the metabolism of growth. He does not believe that the function of the gland is specific, but that to a certain extent it can be performed by other organs. The writer concludes that thymus enlargement is not the direct cause of sudden death. These cases are due to some pathological condition of metabolism which is responsible for the enlargement of the thymus as well as of other glands. Ssokolow believes, however, that there is a type of asthma which is in direct relationship with a thymic enlargement. But this condition must be carefully separated from other conditions which give very similar clinical manifestations.

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ORIGINAL COMMUNICATIONS.

OBSERVATIONS BASED UPON A STUDY OF 139 CASES OF INDUCTION OF LABOR WITH THE MODIFIED CHAMPETIER DE RIBES BAG.*

BY

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THIS series of 139 cases includes seventy-five private and sixty-four hospital or out-door patients. Forty-eight of the women were primiparæ, ninety-one multiparæ. Seventy-five patients, at the time of induction, were at or beyond full term, fifty-three were between eight and nine months, eight were between seven and seven and one-half months, and three were between six and six and one-half months.

The technic of the introduction of the bag is as follows:

The usual preparations for labor having been made, a 1 per cent. lysol vaginal douche is given and the cervix is dilated with the finger, or a steel dilator, preparatory to the introduction of one of the bags, the size depending upon the amount of dilation of the cervix. The bag is first tested to make certain it is perfect, then the base of the bag is pulled out and the bag is rolled up, after which it is seized with a Champetier de Ribes forceps (or with an ordinary uterine dressing forceps), and carefully passed into the cervix, either by inspection or vaginal touch, after which the bag is slowly filled with a sterile solution of lysol or normal salt solution. For this purpose the writer has devised a glass syringe, hav-

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and No. 5 in three cases. It will be noticed that bags No. 2 and 3 were used 146 times out of the total of 198, or 73 per cent.

Frequency of Rupture of the Membranes on Introduction of the Bag.—From the total number of 139 cases, we must subtract four in which the membranes had already ruptured, and one in which the time of rupture was not known, leaving 134 cases. In introducing 193 bags in these cases, the membranes were accidentally ruptured in six instances, or 3 per cent., giving a very small percentage of premature rupture of the membranes.

NUMBER OF BAGS NECESSARY TO INDUCE LABOR.

I. First let us study the thirty-three cases of induction of labor in primiparæ in private work.

In seventeen of these, only one bag was required, or 51.5 per cent.

In eleven, two bags were required, or 33.3 per cent.

In two, three bags were required, or 6 per cent.

In three, labor was not induced by the bag, = 10 per cent.

In other words, labor was induced in approximately 85 per cent. of the primiparæ in private work, by the introduction of not more than two bags. In one of the three cases in which the bags were not successful, the cervix was dilated up to four fingers by means of two bags, then as there was no pain, an attempt was made to introduce a bougie, the membranes being accidentally ruptured in so doing. Labor began in about two hours, and the patient was delivered normally after a five-hour labor. In this case, the use of the bags undoubtedly greatly shortened the labor, although pains were not induced. In another case, two bags dilated the cervix up to three fingers, but no pain followed the bags for a number of hours, when the membranes ruptured and labor began.

In the third case, a bag was introduced into the uterus of a patient who had eclampsia at about six and one-fourth months. Although traction was in this case, made intermittently for about eight hours, there was absolutely no effect, and the patient was delivered by version after accouchement force. The successful cases included one at the seventh month.

II. There were forty-two multiparæ in private work.

In twenty-two of these, one bag was required, or 52.3 per cent.

In thirteen, two bags were required, or 30.9 per cent.

In three, three bags were required, or 7 per cent.

In four, labor was not induced, or 9 per cent.

In other words, labor was induced in approximately 83 per cent. of the multiparæ in private work, by the use of not more than two bags. The four cases in which labor was not induced are however well worth careful study. In one, two bags fully dilated the cervix, but the uterus was inert, and version was resorted to. In another patient, two bags dilated the cervix well, but labor was completed by forceps. In another case, three bags fully dilated the cervix and then a bougie was introduced, but labor could not be induced, and the patient was delivered by forceps.

In the last of the four cases, twenty-four hours after the insertion of the bag, no pain having been induced, the cord was found presenting, making version necessary.

In three of the foregoing cases, the bag certainly accomplished a great deal of work even though the patients could not be delivered in a normal way.

The successful cases included one at six, one at seven months, and one at seven and one-half months.

III. The hospital primiparæ were fifteen in all, but the record of one is incomplete, leaving a total of fourteen.

In thirteen of these, one bag was required, or 93 per cent.

In one of these, three bags were required, or 7 per cent.

Practically all of these cases were induced by the use of one bag.

In this series were included one case at seven months, and one at seven and one-half months.

IV. The hospital multiparæ were forty-nine in number.

In forty-two of these, one bag was required, or 87 per cent.

In six, two bags were required, or 12 per cent.

In one, the bags were ineffectual.

Practically all of these cases were induced by the use of not more than two bags.

In the ineffectual case, three bags were used, but the first stage began only after rupture of the membranes many hours after the last bag had come out.

In this series, were included one case at six months, and two at seven months.

V. *Statistics of all forty-eight primiparæ.*

In thirty, one bag was required, or 64 per cent.

In eleven, two bags were required, or 23 per cent.

In three, three bags were required, or 6 per cent.

In three, bags were ineffectual in inducing labor, or 6 per cent.

In 87 per cent. of these cases, labor was induced by not more than two bags.

VI. *Statistics of all ninety-one multiparæ.*

In sixty-four, one bag was required, or 70 per cent.

In nineteen, two bags were required, or 21 per cent.

In three, three bags were required, or three per cent.

In five, labor was not induced, or 5 per cent.

In 91 per cent. of these multiparæ, not more than two bags were required to induce labor.

VII. *Statistics of all one hundred and thirty-nine cases.*

In ninety-four, one bag was required, or 68 per cent.

In thirty, two bags were required, or 22 per cent.

In six, three bags were required, or 4 per cent.

In eight, labor was not induced, or 6 per cent.

In 90 per cent. of all cases, labor was induced by the use of not more than two bags.

USE OF ANESTHETIC IN INSERTING BAGS.

In private work, an anesthetic was used sixteen times in the introduction of one hundred and fifteen bags, or 14 per cent.

In hospital work, an anesthetic was used in seventeen out of eighty-three, or 20 per cent.

In all cases, thirty-three, in one hundred and ninety-eight, or 16.6 per cent.

The higher percentage in hospital work was due to the necessity of using an anesthetic when demonstrating the technic before students.

TIME REQUIRED FOR LABOR TO BEGIN.

I. *Statistics of thirty-three primiparæ in private work.*

In fifteen, labor began at once, = 45 per cent.

In five, labor began within six hours, = 18 per cent.

In four, labor began within twelve hours, = 12 per cent.

In two, labor began within twenty-four hours, = 6 per cent.

In one patient, thirty-nine hours were required, in a second, forty hours, in a third sixty hours, in a fourth seventy-two hours, and in three patients, labor was not induced. In other words, labor began at once in 45 per cent., within twelve hours in 73 per cent., and within thirty hours in 79 per cent.

II. Statistics of forty-two multiparæ in private work.

In nine, labor began at once, = 22 per cent.

In eleven, labor began within six hours, = 26 per cent.

In six, labor began within twelve hours, = 14 per cent.

In six, labor began within twenty-four hours, = 14 per cent.

In two patients, twenty-eight hours were required, in a third thirty-one hours, in a fourth forty-two hours, in a fifth forty-five hours, in a sixth sixty-two hours, and in four, labor was not induced. Labor began at once in 22 per cent.; within twelve hours, in 63 per cent; within thirty hours in 85 per cent.

III. Statistics of fifteen primiparæ in hospital work.

In eight, labor began at once, = 57 per cent.

In three, labor began within six hours, = 21 per cent.

In one, labor began within twelve hours, = 7 per cent.

In one, labor began within twenty-four hours, = 7 per cent.

In one, labor began within thirty hours, = 7 per cent.

In one, no figures were available. Labor began at once in 57 per cent.; within twelve hours in 85 per cent.; within thirty hours in 100 per cent.

IV. Statistics of forty-nine multiparæ in hospital work.

In eighteen, labor began at once, = 39 per cent.

In ten, labor began within six hours, = 20 per cent.

In five, labor began within twelve hours, = 10 per cent.

In seven, labor began within twenty-four hours, = 14 per cent.

Other cases required twenty-four and a half hours, twenty-seven hours, twenty-eight and three quarter hours, forty-nine hours, seventy-seven hours and one eight days thirteen hours(?).

In three cases, figures were not available. Labor began at once in 39 per cent.; within twelve hours in 71 per cent.; within thirty hours in 93 per cent.

V. Statistics of all forty-eight primiparæ (hospital and private).

In twenty-three, labor began at once, = 49 per cent.

In thirty-six, labor began within twelve hours, = 76 per cent.

In forty, labor began within thirty hours, = 85 per cent.

VI. Statistics of all ninety-one multiparæ (hospital and private).

In twenty-seven, labor began at once, = 31 per cent.

In fifty-nine, labor began within twelve hours, = 68 per cent.

In seventy-eight, labor began within thirty hours, = 89 per cent.

VII. Statistics of all 139 cases.

In fifty, labor began at once, = 37 per cent.

In ninety-five, labor began within twelve hours, = 70 per cent.

In 118, labor began within thirty hours, = 88 per cent.

VIII. *Average number of hours before beginning of labor.*

In thirty of thirty-three primiparæ (private) average was ten hours.

In thirty-eight of forty-two multiparæ (private) average was eleven hours and thirty minutes.

In fourteen of fifteen primiparæ (hospital) average was four hours and fifty-two minutes.

In forty-five of forty-nine multiparæ (hospital) average was nine hours and four minutes.

Average in all primiparæ = eight hours and twenty-two minutes.

Average in all multiparæ = ten hours and twenty-two minutes.

Average in all cases = nine hours and forty-one minutes.

LENGTH OF LABOR.

I. From the total of thirty-three primiparæ in private work, four may be excluded because of the necessity of interfering with the course of labor on account of eclampsia or threatened eclampsia. (The average duration of labor in these four was ten hours forty-three minutes.) The shortest labor was five hours, the longest was sixty-six hours forty minutes.

Twenty cases of twenty-nine were delivered within twenty-four hours, or a percentage of 64.5, the average labor being fourteen hours twenty-four minutes. The remaining nine cases required twenty-four hours thirty-five minutes, twenty-five hours forty minutes, twenty-six hours ten minutes, thirty-four hours fifty minutes, fifty hours, fifty-four hours fifty minutes, fifty-seven hours fifty minutes, sixty-five hours thirty-five minutes and the last sixty-six hours forty minutes, giving an average for the nine cases of forty-five hours eleven minutes.

In one of these cases, real labor was sixteen hours twenty minutes instead of thirty-four hours fifty minutes, in another one hour and fifty minutes, instead of fifty-seven hours fifty minutes and in a third case four hours fifteen minutes instead of sixty-five hours thirty-five minutes—allowing for these deductions, the average labor was thirty hours five minutes instead of forty-five hours eleven minutes.

The average duration of labor in all primiparæ in private work was twenty-two hours twenty minutes.

Deducting 135 hours for the three cases above mentioned, the average duration of labor would be eighteen hours thirteen minutes.

II. From the total of forty-two multiparæ in private work, we shall exclude two cases in which version was done for cord presentation, thus interrupting the normal course of labor, leaving total of forty.

The shortest labor was one hour seven minutes, the longest was forty-seven hours thirty minutes.

Twenty-nine of forty cases were delivered within twenty-four hours or 72.5 per cent., the average labor being ten hours one minute (against fourteen hours twenty-four minutes in primiparæ).

The other eleven cases required twenty-five hours forty-five minutes, twenty-nine hours twenty-two minutes, thirty hours, thirty-one hours five minutes, thirty-one hours forty minutes, thirty-three hours, forty hours, forty-six hours twenty-five minutes, forty-six hours forty minutes, forty-seven hours fifteen minutes and forty-seven hours thirty minutes.

The average of these eleven is thirty-seven hours twelve minutes.

The average duration of labor in all multiparæ was seventeen hours twenty-nine minutes (against twenty-two hours twenty minutes in primiparæ).

III. There were fifteen primiparæ in hospital work. The shortest labor was six hours forty minutes, the longest seventy-nine hours fifty-two minutes (?).

Eleven of fifteen cases required less than twenty-four hours or 73 per cent. The average duration of labor for these eleven was twelve hours fifty-three minutes.

The other four cases required twenty-six hours, thirty-five hours thirty minutes, forty-two hours thirty-five minutes and seventy-nine hours fifty-two minutes(?).

The average duration for all four was forty-six hours nine minutes.

The average duration of labor for all primiparæ in hospital work was twenty-one hours forty-five minutes, practically the same as for private work.

IV. Of the forty-nine multiparæ in hospital work, the shortest labor was one hour thirty minutes and the longest was seventy-seven hours(?).

Thirty-nine of forty-nine required less than twenty-four hours or 79 per cent., the average duration of labor being nine hours nineteen minutes.

The remaining cases required twenty-six hours forty-five

minutes, twenty-seven hours, twenty-eight hours, twenty-nine hours, twenty-nine hours twenty-five minutes, thirty hours eight minutes, thirty-two hours forty-five minutes, thirty-three hours, fifty-eight hours forty minutes and seventy-seven hours(?).

The average for these ten cases was thirty-seven hours twenty-six minutes.

The average duration of labor in all hospital multiparæ was fifteen hours three minutes.

V. *In all primiparæ* (forty-eight) (hospital and private), the shortest labor was two hours fifty minutes and the longest labor was seventy-nine hours fifty-two minutes, the average duration of labor twenty-two hours nine minutes.

In all multiparæ (ninety-one) (hospital and private), the shortest labor was one hour seven minutes, the longest labor was seventy-seven hours,(?) the average duration of labor fifteen hours fifty-two minutes.

In all cases, the average duration of labor was eighteen hours two minutes.

TERMINATION OF LABOR.

I. Private patients

Normal	29 = 39 per cent.	} 71 per cent.
Low forceps	24 = 32 per cent.	
Median forceps	12 = 16 per cent.	
High forceps	3 = 4 per cent.	
Version	4 = 5 per cent.	
Breech extraction	2 = 2.5 per cent.	
Died undelivered	1 = 1 per cent.	
(Eclampsia)		

Total..... 75

II. Hospital cases.

Normal	39 = 61 per cent.	} 70 per cent.
Low forceps	6 = 9 per cent.	
Median forceps	3 = 4.5 per cent.	
High forceps	1 = 2 per cent.	
Version	10 = 15 per cent.	
Craniotomy	1 = 2 per cent.	
Breech extraction	3 = 4.5 per cent.	
Cesarean section	1 = 2 per cent.	

III. *Statistics of all cases.*

Normal	68 = 49 per cent.	} 70 per cent.
Low forceps	30 = 21 per cent.	
Median forceps	15 = 11 per cent.	
High forceps	4 = 3 per cent.	
Version	14 = 10 per cent.	
Breech extraction	5 = 3 per cent.	
Craniotomy	1 = 1 per cent.	
Cesarean section	1 = 1 per cent.	
Died undelivered.....	1 = 1 per cent.	

CHANGE OF PRESENTATION AFTER BAG INTRODUCTION

I. Private patients.

CASE I.—vi-Para, induction of labor at seven months for flat pelvis. Bag No. 3 introduced at 11 A. M., July 3, position *L. O. A.* above brim. Bag came out at 9 P. M. of the same day, examination of patient not made at that time. At 9 A. M. on the following day, the presentation was breech, and No. 4 bag was introduced. This bag came out at 8 A. M. of the next day, the first stage beginning at that time. Several hours later, position was found to be *transverse*, and the patient was delivered by podalic version at 11.45 A. M. of a 4 $\frac{3}{4}$ pound child which died two hours later of meningeal hemorrhage.

CASE II.—ii-Para, with a normal pelvis, but a history of a large child and very difficult forceps delivery at term. Induction of labor at 8 months, child being of good size (7 $\frac{7}{16}$ pounds). At the time of introduction of the No. 3 bag at 10 P. M. Jan. 4, the position was *R. O. A.* the vertex dipping in the brim. The bag came out at 8 A. M. on the following day, and a few hours later when examination was made, the position was found to be *transverse*. By external version, the vertex was easily brought over the brim of the pelvis, then the membranes were ruptured and normal delivery occurred one hour later. Fortunately, the membranes remained intact, or version for transverse position would have been necessary.

CASE III.—iii,—ii-Para; previous history of difficult delivery with slightly contracted pelvis. Induction of labor at eight and a half months, position *L. O. A.* above the brim, the first bag No. 3 being easily introduced at 10 P. M. Nov. 6. The first stage began at 2 A. M. on the following day, and the bag came out at 9 A. M. At 2.30 P. M., a No. 4 bag was introduced and this was expelled at 10 P. M. The position was now found to be *transverse*, but by external version, the vertex was easily brought over the brim in *L. O. A.* position, and then the membranes were artificially ruptured. About twelve hours later the patient was delivered of a fine child weighting 6 $\frac{12}{16}$ pounds, by the median forceps operation.

CASE IV.—ii-Para, a patient whose child had died *in utero* three days before she had reached full term in her first pregnancy.

Induction of labor at eight and one-half months with breech presentation, moderate hydramnion present. On Dec. 26, at noon a No. 3 bag was inserted, coming away at 11 P. M. Patient slept most of the night. On Dec. 27, at 11:30 A. M. the position was *transverse*, and by external version, the presentation was easily changed to R. O. A. after which a No. 4 bag was inserted. The labor commenced at once, and the patient was delivered normally of a 6 12/16 pound child, after a nine hour labor.

In seventy-five private cases, the presentation was changed, therefore, in four instances, or 5 per cent. Fortunately, the change in presentation made no difference in the outcome of these cases, but the accident must be kept constantly in mind when using the bag method.

II. Hospital Patients.

CASE I.—ii-Para at term with justminor pelvis. Position L. O. A. above brim. Bag No. 1 introduced at 4 P. M. Nov. 13 came away at midnight. No. 2 bag was inserted at 10 A. M. Nov. 14, came out 4 A. M. Nov. 15. During the first stage, the *presentation changed from vertex to breech (L. O. A.—L. S. A.)*, and labor was terminated by breech extraction, the child being still-born.

CASE II.—iii-Para, induction of labor at eight and one-half months for flat pelvis. No. 3 bag introduced at 2 P. M. Feb. 2. position R. O. A. above brim. Between that time and 8:45 P. M. *the presentation changed to L. S. A.* The amniotic fluid was abundant and the child was small (5 12/16 pounds). The patient was delivered normally of a living child in fine condition after a labor of six hours and forty-five minutes, the presentation remaining breech.

CASE III.—ix-Para, labor induced for marginal placenta previa at eight and one-half months.

On Feb. 4, a No. 5 bag was introduced at 4:30 P. M. the position being L. O. A. above the brim. There was no bleeding after the insertion of the bag. At 6:30 P. M. on the following day, labor having been in progress for four hours, it was necessary to deliver because of the weak condition of the patient. The cervix admitted three fingers, and *the presentation was found to have changed to shoulder.* Version was done, and a 7 pound dead child was extracted. The heart had not been heard at any time, before or during labor.

In sixty-four cases in hospital practice, the presentation was changed in three cases, or 4.7 per cent. In the first of the three cases, the change of presentation was probably responsible for the loss of the child, while in the other two it made no difference.

In 139 cases, the presentation changed in seven, a percentage of five, but in only one case was the outcome changed because of the accident.

PROLAPSE OR PRESENTATION OF THE CORD.

I. Private Cases.

CASE I.—ii-Para, pelvis normal, history of uterine inertia in previous labor, with large child, difficult forceps delivery and death of child from meningeal hemorrhage.

It was decided to induce labor at eight months, and the position being *L. S. A.* an unsuccessful attempt was made to change the presentation to vertex by external manipulation. On June 17, a No. 3 bag was inserted at 9 P. M. On June 18, at 10 A. M. the cervix admitted almost four fingers, and a No. 4 bag was introduced, but this soon came out, so the membranes were ruptured. At 2.30 P. M. as there was no pain, the patient was examined preparatory to putting in a No. 5 bag. The feet and cord were found in the cervix, and replacement was attempted with the woman in the knee-chest position. This could not be done, so the cervix was dilated manually and the child was extracted. The infant weighed 5 $\frac{12}{16}$ pounds and was deeply asphyxiated, but soon cried vigorously. At the end of twenty-four hours, however, the child died, evidently of meningeal hemorrhage.

CASE II.—ii-Para, pelvis normal, child of good size, induction at term. At 10 A. M. a No. 3 bag was introduced, coming out at 9 P. M. The position during this time was *R. O. P.* above the brim. Examination at 9 A. M. of the following day revealed a vertex and cord presentation, the membranes being intact. As the cord could not be replaced by posture, version was performed by the combined method, and then, as the cervix was only about half dilated, and as there was no need of haste, the child was not extracted until five hours later. The infant weighed 7 $\frac{1}{2}$ pounds, respirations were spontaneous, and the child did well. I have seen prolapse of the cord in one other case, where the bag was used to accelerate labor, but these are the only three I have seen in a large number of cases. *In seventy-five private cases, therefore, the cord presented twice, or in 2.6 per cent.* The mortality was 50 per cent.

II. Hospital Cases.

CASE I.—viii-Para, labor induced at eight months for an acute exacerbation of chronic nephritis. At 3.30 P. M. the position being *R. O. P.* above, a No. 3 bag was inserted. This was expelled at 9 P. M., and a No. 4 bag was introduced. The second stage began at 12.30 A. M. and at 1 A. M. the membranes were ruptured. About 10 inches of cord prolapsed, version was performed at once, and a 6 pound child was extracted. The infant did fairly well, and left the hospital in fair condition.

CASE II.—iii-Para, labor induced at eight and one half months, for slightly contracted pelvis. The position was *L. O. A.* above, when at 4.30 P. M. a No. 1 bag was introduced. At 8 P. M. the bag came out and a No. 2 bag was inserted. A No. 3 bag was inserted at 10 A. M. of the following day and at 3.30 P. M.

a No. 4 bag was put in, but the latter was at once expelled. As there was no pain a bougie was inserted. There was no cord palpable at this time, but nevertheless the case is reported as one in which the cord prolapsed. At 4 P. M. of the following day, the membranes were artificially ruptured, and a large amount of pulseless cord prolapsed. A version was performed, and a dead child weighing 8 pounds was extracted. Whether the bags were responsible for the prolapse we cannot state definitely, but the case has been included in the number.

CASE III.—iii-Para, patient at term, induction for flat pelvis with chronic endocarditis. At 3 P. M. the position was *L. O. A.* above, and a No. 2 bag was inserted, labor beginning at once. At 2 P. M. of the following day a No. 3 bag was inserted, the membranes being accidentally ruptured in so doing. At 10 P. M. the second stage began, and the bag came out. The cord was found prolapsed and pulseless, the head wedged in the brim of the pelvis. One hour later the patient gave birth to a still-born child weighing 6 6/16 pounds.

CASE IV.—iii-Para, normal pelvis, labor induced because of large child. At 2 P. M. position was *L. O. A.* and a No. 4 bag was inserted coming out at 10.30 P. M. At 11.20 P. M. cord presentation was found, the membranes ruptured spontaneously, the cord prolapsed, and stopped pulsating before version could be performed. The child was still-born and weighed 10 8/16 pounds.

The mortality in the four cases was 75 per cent. *In the sixty-four cases then the cord prolapsed in four, a percentage of six.* Looking over the New York Post-Graduate Hospital records of 5300 cases there were found (excluding the cases here reported) fifty-eight cases of cord prolapse, approximately 1 per cent. *In all 139 cases, the cord presented or prolapsed in six, or 4.3 per cent.* Prolapse of the cord is therefore four times as frequent with the use of the bag, but it must be remembered that labor was induced in sixty-three cases for contracted pelvis, disproportion between the head and the pelvis and hydramnion and in three of the six cases of prolapse there was either disproportion or deformed pelvis, and therefore the number of cases would seem to me not large.

Bag Introduced, Slipping above the Head.—In this series of cases a curious accident occurred in one, resulting in no harm. Labor was induced in a iii-para, at eight months, for flat pelvis. At 12.30 P. M. the position was *L. O. A.*, and a No. 3 bag was easily introduced. One hour later the membranes ruptured spontaneously. On the following day at 3.30 P. M. the patient was examined, as there had been no labor pains. The bag was found to have slipped up into the uterus above the head. Traction upon the stem brought the bag down into the cervix, the first stage began at 4.30 P. M. and labor was completed

normally in three hours. This accident would not have taken place had the stem been tied to the vulva pad in the usual way.

MORBIDITY.

I. Private Patients.

CASE I.—This was one of the patients in whom the bag was ineffectual. In spite of intermittent traction, after eight hours, the cervix was still but slightly dilated, and the eclamptic patient was delivered by accouchement force and version. A slight rise of temperature was present for a few days following delivery, but recovery soon took place. The eclampsia was no doubt the cause of the temperature.

CASE II.—i-Para, normal pelvis, labor overdue. Patient had a seventeen hour labor terminated by an easy low forceps operation. For one week following the delivery the temperature ranged between 99–101° F., but there were no other symptoms and the patient felt perfectly well during this time. The cause was not discovered.

CASE III.—ii-Para, eleven-hour labor, terminated by an easy low forceps operation. Seven hours after labor the temperature rose to 100° and was apparently reactionary in character. Nine days after delivery, there was a temperature of 100, and on the twelfth day 100°. Nineteen days after delivery the temperature rose to 101°, the cause of which was threatened abscess of the breast, but in two days the temperature came to normal, and remained normal.

CASE IV.—iii-Para, labor four hours, terminated normally. During the puerperium, there were four distinct rises of temperature, with three days intervening between the elevations, during which interval the temperature and pulse were normal. The uterus was absolutely normal, and the cause of the rise of temperature was evidently in the intestinal tract. There were no symptoms whatever referable to the uterus, vagina or tubes.

From a study of these private cases, it is apparent that in only one case (No. 2), could the morbidity be ascribed to the bag, and we conclude that the morbidity in private work is practically nil.

II. Hospital Cases.

CASE I.—ii-Para, labor eight hours, terminated by breech extraction. On the third day there was a temperature of 100° caused apparently by the congestion of the breasts. Subsequent temperature was normal.

CASE II.—This was a case of Cesarean section where there was a slight elevation of temperature only for a few days.

CASE III.—ii-Para, labor eighteen hours, terminated normally. On the tenth day the temperature rose to 104° F., the pulse to 130. On the next day the temperature and pulse were normal and remained so thereafter.

CASE IV.—viii-Para, labor induced at eight months for chronic nephritis, the patient being in miserable general condition. For several weeks following delivery there was a slight rise of temperature each day, then the further course was normal. There were no symptoms referable to the uterus and the temperature was attributed to the poor general condition of the woman.

CASE V.—Labor induced at the seventh month for toxemia of pregnancy. One bag was used, labor started at once and was terminated normally in 1 1/2 hours. On admission to the hospital the temperature was 103°, pulse 126, respiration 30, and for one week after delivery the temperature ranged between 100–103° F., remaining normal after the first week.

CASE VI.—Labor induced for eclampsia at the seventh month. One bag was used, labor commenced at once, and the woman was delivered normally after a nine hour labor. There was temperature of 101–103° during the first week postpartum, and again with an attack of pneumonia one week later, patient finally recovering.

CASE VII.—ii-Para, patient apparently two weeks overdue. One bag was used, labor began in two and one-fourth hours, and patient was delivered normally after a labor of six hours and fifty minutes, of a 9 pound healthy child. On the tenth day postpartum, the temperature rose to 102° F., the bowels were moved, and the subsequent temperature was normal.

CASE VIII.—15 i-Para, labor induced at eight and three-fourth months for chronic nephritis. One bag was used, labor began at once, and the patient was delivered by version of a 7 pound child which had evidently been dead some time. The temperature on the fourth evening postpartum was 104°, on the fifth 102°, the sixth 102°, then the temperature gradually came to normal, and the patient left the hospital on the twelfth day in good condition.

CASE IX.—vii-Para, labor induced at term for flat pelvis. Two bags were used, the labor was of twenty-two hours duration, and craniotomy was done, as the child was dead. The heart had been heard, however, two hours before operation. On the sixth day the temperature rose to 102.8° F. after a chill, but on the following day and subsequently the temperature was normal.

CASE X.—iv-Para, labor induced at the eighth month for severe chronic endocarditis, not compensating, and poor general condition. One bag was used, labor began seven hours later and the duration of labor was nine hours. The patient was delivered normally of a 4 11/16 pound child, deeply asphyxiated, which died on the following day. The temperature ranged between 101–103° F. for the first four days postpartum, then came to normal and remained there.

Of these ten hospital cases of temperature in the puerperium, there were only three cases (Nos. 4, 8 and 10) which should be taken into consideration concerning bag morbidity, and cases

I. In private work, the infant mortality was as follows:

Pelvis and cause of induction	Period of gestation	Labor	Operation	Weight	Days of life	Cause of death
1. Flat pelvis vi-para,	7 1/2 mo.	3 Hours, 45 min.	Version.	4 12/16 lb.	1	Meningeal hemorrhage.
2. Pelvis normal, i-para.	Several days overdue.	5 Hours.	Normal delivery.	7 lb.	1	Patent foramen ovale.
3. Pelvis normal, iii-para.	2 weeks overdue.	25 Hours, 45 min.	Low forceps.	4 12/16 lb, poorly developed.	Still-birth.	Poor development.
4. Eclampsia, i-para.	Term.	10 Hours, 30 min.	Low forceps.	3 8/16 lb.	Still-birth.	Chronic nephritis, eclampsia.
5. To anticipate placental de-generation, iii-para.	8 1/2 months.	4 hours.	Low forceps.	5 12/16 lb.	1	Atelectasis.
6. Flat pelvis, i-para.	8 1/4 months.	22 hours, (6 hours hard.)	Low forceps.	6 11/16 lb.	2	Meningeal hemorrhage.
7. Eclampsia, i-para.	8 mo.	12 hours.	Died undelivered. . . . .	. . . . .	Death <i>in utero</i> .	Eclampsia.
8. Hydramnion and great discom-fort, iv-para.	8 1/4 months.	18 hours.	Median forceps.	6 8/16 lb.	Still-birth.	Maldevelopment, hernia in cord, etc.
9. Previous history of inertia, etc., ii-para.	8 mo.	Duration(?) 19 hours from first bag.	Version for pro-lapsed cord.	5 12/16 lb.	1	Deep asphyxia, meningeal hem-orrhage.
10. Justomnior pelvis, iii-para.	8 mo.	24 hr.	Normal delivery.	6 13/16 lb.	2	Deep asphyxia, meningeal hem-orrhage.

II. In hospital work the infant mortality was as follows:

Pelvis and cause of induction	Period of gestation	Labor	Operation	Weight	Days of life	Cause of death
1. Justomino pelvis, ii para....	Term.....	8 hr.....	Breech extraction....	7 lb.....	Still-birth....	Difficult Breech extraction.
2. Acute nephritis, i para....	8 1/2 mo.....	10 hr.....	Normal delivery....	4 4/16 lb.....	2	Atelectasis, prematurity.
3. Justomino pelvis, v para....	8 1/2 mo.....	29 hr.....	Podalic version....	6 8/16 lb.....	Still-birth....	Difficult Breech extraction.
4. Justomino pelvis, iii para....	8 1/2 mo.....	32 hr.....	Podalic version....	8 lb.....	Still-birth....	Prolapsed cord.
5. Chronic nephritis, xii para....	7 mo.....	5 hr.....	Median forceps.....	4 8/16 lb.....	3 (?).....	General edema, prematurity.
6. Toxemia of pregnancy, iii para....	7 mo.....	1 1/2 hr.....	Normal delivery....	4 5/16 lb.....	1	Prematurity.
7. Eclampsia, i para....	7 mo.....	9 hr, 10 min.....	Normal delivery....	5 4/16 lb.....	Still-birth....	Eclampsia.
8. Chronic nephritis, ii para....	8 mo.....	16 hr, 55 min.....	Podalic version....	7 10/16 lb.....	Still-birth....	Chronic nephritis.
9. Hydramnion, distress, viii para....	Term.....	2 hr, 45 min.....	Low forceps.....	11 12/16 lb.....	Still-birth....	Deep asphyxia, great difficulty in shoulder delivery, large child.
10. Justomino pelvis, i para....	8 1/2 mo.....	26 hr.....	Podalic version....	5 2/16 lb.....	3	Moderate asphyxia, prematurity, difficult delivery.
11. Chronic nephritis, xv para....	8 3/4 mo.....	13 hr., 45 min.....	Podalic version....	7 lb.....	Still-birth....	Child had been dead for some days, cause nephritis(?).
12. Justomino pelvis. Poor genera condition, ii para....	8 1/2 mo.....	17 hr., 25 min.....	Normal delivery (breech).	4 15/16 lb.....	Still-birth....	Asphyxia <i>in utero</i> .
13. Flat pelvis, chronic endocarditis, ii para....	Term.....	32 hr., 45 min.....	Normal delivery....	6 6/16 lb.....	Still-birth....	Prolapsed cord.
14. Flat generally contracted pelvis, vii para....	Term.....	22 hr.....	Craniotomy.....	6 5/16 lb.....	Still-birth....	Intrauterine asphyxia(?) (heart heard two hours before birth).

II. Continued. In hospital work the infant mortality was as follows:

Pelvis and cause of induction	Period of gestation	Labor	Operation	Weight	Days of life	Cause of death
15. Flat, generally contracted pelvis, iii-para.	Term?.....	Duration? 58 hr. from insertion of first bag.	Normal delivery....	4 8/16 lb.....	1	Deep asphyxia, prematurity?
16. Albuminuria, pelvis normal, i-para.	Term.....	Duration? 36 hr. from insertion of first bag.	Normal delivery....	6 15/16 lb.....	5	Inanition.
17. History of difficult deliveries, pelvis normal, iv-para.	Term.....	17 hr., 50 min.....	Median forceps.....	6 12/16.....	2	Moderate asphyxia, meningeal hemorrhage.
18. Pelvis normal, patient very nervous, iii-para.	Term.....	30 hr.....	Low forceps.....	5 2/16 lb.....	Still-birth....	In utero asphyxia.
19. Pelvis normal large child, iii-para.	Term.....	Duration? 21 hr. from insertion of first bag.	Podalic version.....	10 8/16 lb.....	Still-Birth....	Prolapsed Cord.
20. Membranes ruptured for 3 days, large child, normal pelvis, x-para.	3 weeks beyond term.	Duration? 29 hr. from insertion of first bag.	Breech extraction, craniotomy of after-coming head.	9 12/16 lb, (minus brains).	Still-birth....	Difficult Breech extraction.
21. Severe chronic endocarditis, poor general condition, iv-para.	8 mo.....	9 hr., 20 min.....	Normal delivery....	4 11/16 lb.....	2	Deep asphyxia, prematurity.
22. Marginal placenta previa, ix-para.	8 1/2 mo.....	5 hr., 10 min.....	Podalic version.....	7 lb.....	Still birth.....	Hemorrhage from placenta previa, in utero asphyxia, (heart never heard).

4 and 10 were in such poor condition that temperature under any circumstances was not at all surprising, as their power of resistance was very low.

FETAL MORTALITY.

The study of these 139 cases would be incomplete without considering infant mortality.

I. In private work ten children were lost, as shown in the table on page 768.

II. In hospital work twenty-two children were lost, as shown in the tables on pages 769-770.

SUMMARY OF INFANT MORTALITY.

I. Private Patients.

Among the deaths in private work we may reasonably exclude six (Nos. 2, 3, 4, 5, 7, 8), leaving four, or 5.3 per cent. mortality (including one case of prolapsed cord).

II. Hospital Patients.

Among these cases we may reasonably exclude ten cases (Nos. 2, 5, 6, 7, 8, 9, 11, 20, 21, 22) leaving twelve, a mortality of 20 per cent.

Subtracting from the twelve, three cases of prolapsed cord and two of difficult breech extraction we have seven, a mortality of 11 per cent., comparing unfavorably with the mortality in private work.

Maternal Mortality.—In private work there were three deaths among the seventy-five patients. One patient died of eclampsia fifteen hours after delivery, another died of eclampsia during labor, undelivered, and the third died of eclampsia eight hours after delivery.

In hospital work, one patient died thirty-six hours after delivery from chronic nephritis and toxemia of pregnancy.

The mortality then, in bag induction may be said to be nil.

CONCLUSIONS.

1. For the induction of labor with the bag, sizes two and three are most useful.
2. Accidental rupture of the membranes occurs in only 3 per cent. of all cases.
3. The great value of the bag is shown by the fact that in 90 per cent. of all cases, labor was induced by the use of not more than two bags, while in nearly 70 per cent. one bag was sufficient. In only 6 per cent. of all cases was labor not induced by the bags.

4. Anæsthesia for bag introduction is usually unnecessary, as shown by the fact that in only 14 per cent. of private cases was an anesthetic used, or in 16.6 per cent. of all cases including many hospital cases in which the anesthetic was deemed advisable for clinical purposes.

5. In 37 per cent. of all cases, labor begins at the time of the introduction of the first bag, in 70 per cent. of all cases, labor commences within twelve hours after the insertion of the first bag, while in 88 per cent. of all cases, labor begins within thirty hours after the insertion of the first bag.

6. The average length of time intervening between the insertion of the bag and the onset of labor is in primiparæ eight hours and twenty-two minutes, in multiparæ ten hours and twenty-two minutes, and in all cases, nine hours and forty-one minutes.

7. In all primiparæ, the average duration of labor induced by the bag, was twenty-two hours nine minutes. In all multiparæ, the average was fifteen hours fifty-two minutes and the average in all cases was eighteen hours two minutes.

8. Forty-nine per cent. of labors induced by the bag terminated normally and 70 per cent. terminated normally or with the low-forceps operation.

9. In 5 per cent. of all cases, the presentation was changed, but in only one case was the outcome affected because of the accident.

10. In 139 cases, the cord presented or prolapsed in six, or 4.3 per cent., but it must be remembered that in sixty-three cases, labor was induced for contracted pelvis, relative disproportion or hydramnion, and that therefore the accident under any circumstances was much more likely to occur.

11. The morbidity in private work is practically nil, and in hospital work very slight.

12. The foetal mortality in private work was about 5 per cent., in hospital work 11 per cent. This can be explained partly by the fact that private patients receive naturally more individual attention, and the results necessarily are correspondingly better.

13. The maternal mortality from the use of the bag is nil.

VAGINAL HYSTEROTOMY IN THE LATE MONTHS OF PREGNANCY.*

(WITH A REPORT OF FOURTEEN PERSONAL CASES.)

BY

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It will be acknowledged, I think, by all who are actively engaged in the practice of obstetrics and who are honestly striving to further obstetrical education, that obstetrical standards are woefully unsatisfactory in this country to-day. These standards will only *then* be improved when both physicians and laymen recognize that "obstetrics" is one of the fundamental branches of medicine; that the trained obstetrician is as important as the surgeon and the internist, and that only those carefully trained in this branch are competent to handle the numerous complications that have so frequently to be dealt with.

As Whitridge Williams has recently pointed out, "major obstetrics is major surgery, and should only be undertaken by competent men in control of abundant hospital facilities." The subject which I present to you to-night is one of major obstetrics. Vaginal hysterotomy at term, or in the late months of pregnancy, is an operation that deserves more attention than it has heretofore received in this country. One has but to refer to the literature to realize that up to the present time this operation has gained but a limited popularity among us compared to its position abroad. Much of this lack of enthusiasm is due (1) to the fact that a large number of so-called obstetric specialists have had neither a surgical nor a gynecological training; and (2) to the natural disinclination of the great body of practitioners to adopt advanced standards in obstetrics. In approaching this subject, we must draw a sharp line of distinction between hospital work and private practice; and, furthermore, the subject should only be recommended to a trained body of men,—men trained in surgical obstetrics.

Hospital statistics in obstetrics should be superior to such statistics in the home. The skilled physician should expect

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to make use of procedures which will enable him to obtain better results than the unskilled—procedures which would prove hazardous in the hands of the latter. I beg of you, gentlemen, to keep this statement in mind, for if you do not, my few remarks will be dangerous, and my own attitude toward conservatism on the one hand and radicalism on the other will be misunderstood.

It is then to the specialist and to him alone that I am advocating the wider adoption of vaginal hysterotomy in the late months of pregnancy. I desire to restrict my remarks to the operation performed in the late months of pregnancy, because at such a time the technical difficulties and dangers are, as a rule, quite apart from those met with in the operation performed at an earlier date. In the early months of gestation, the operation resembles an ordinary vaginal hysterotomy for submucous fibroid or what not, while at a later period the entire picture is changed. To obtain good results *then*, a great deal of judgment and a large amount of skill may be required. The operation cannot be discussed with any degree of fairness or with intelligence without a thorough, definite understanding of what it *really* accomplishes when it is *actually* performed. By this I mean that we must bear clearly in mind the great differences between a true vaginal Cesarean section and the much simpler operation of “incising the obstructing cervical ring.”

A. *The Operation of Cervical Incisions.*—This procedure means the use of one to four incisions, rarely over 4 cm. long, in that portion of the cervix that remains after the practical flattening-out process has taken place, and *not* until then. These incisions can therefore only be correctly and safely used when the body of the cervix is effaced, and when the presenting part of the infant is prevented from entering the vagina proper, merely by the infravaginal portion of the cervix. No dissection is required before making the incisions, and with care, there is little danger.

B. For the performance of a true vaginal hysterotomy, the cervix must be long, moderately unyielding, and with little or no dilatation.* The bladder must be displaced to avoid injury before the uterus is incised. In order to obtain sufficient room, the incision is carried well up into the lower uterine zone; hence it must be longer than in the simpler type of operation. The anterior incision is, as a rule, preferable to the posterior one—both because it is easier of execution, and because it renders

* There may be some few exceptions to this.

the patient less susceptible to infection. In many cases, in the absence of any previous cervical dilatation and with a large child, it is decidedly safer to employ two incisions. The latter will not have to be more than 7 cm. in length, while a single incision must be from 12 to 14 cm. in length to gain the necessary room. Peterson, in 448 cases, found the anterior incision used in 66.07 per cent. The chief difficulty in the operation lies in the fact that in many instances, with the child riding high at the pelvic brim, and with the cervix likewise high up, the uterus cannot be drawn down satisfactorily. This means that when a long incision is required the upper section of the cut will probably have to be made by the sense of touch and not by sight. In a muscular primipara, at or near term, with little or no settling of the child, the operation is *not* an easy one. This statement is made cautiously, but I believe it to be true, even when a man well accustomed to the technic is performing it.

The differences then between the two operations are marked. To confuse them shows a complete lack of understanding of the principles involved, yet I am forced to believe from study of the numerous discussions on this topic, as well as from some personal observations, that the lesser operation is too often given the name of the greater.

Vaginal hysterotomy should be restricted to serious conditions of mother or child. It affords a method of rapidly emptying the uterus in a surgical manner. It should never be performed where the simpler Dührssen incisions will answer, nor in cases where a manual dilatation can be safely and rapidly carried out. I maintain, however, that a cervix that is long, rigid, and that has little or no dilatation, is *not* a cervix for rapid manual dilatation. The dilating under such circumstances must resolve itself, in many cases at least, into merely a tearing process—the muscle fibers giving away only to brute force. In order to safely carry out a rapid manual dilatation, there should be some softening and some absorption of the cervix, and preferably, too, some beginning spontaneous dilatation. Each operation, then, has its own field, and the indications for vaginal hysterotomy should not be confused with those calling for a manual dilatation or the simpler cervical incisions.

CONDITIONS JUSTIFYING VAGINAL HYSTEROTOMY.

1. Unusual rigidity of the cervix (from lack of development, or scar tissue); this condition will but rarely demand the opera-

tion, if the patient is allowed to go into labor spontaneously and nature is given a fair chance.

2. Eclampsia with or without convulsions.
 3. Placenta previa centralis.
 4. Severe accidental hemorrhage.
 5. Sudden danger to child, especially in prolapse of the cord.
 6. Acute emergencies arising in the course of certain bad cases of heart disease, tuberculosis, etc.
 7. Certain rare cases of hydatid mole, with severe bleeding and rigid cervix.
 8. Carcinoma of the cervix.
 9. Certain prolonged labor cases in primiparæ, where the cervix refuses to flatten out and where the head is grasped too snugly by the lower segment of the lower uterine zone. This condition gives many still-births even in competent hands.
 10. It is excellent for immediate postmortem section with the child still alive. It can be done at once without the consent of the family, and without the possibility of legal complications.
- Let us now consider more specifically certain of the above mentioned indications.

1. *Eclampsia with or without Convulsions.*—Before discussing the question of the justification of this operation in eclampsia, we should first contrast the two prevailing methods of treating these cases. The one school teaches conservatism, the other radicalism. Both methods have given good results in careful hands. In this country, G. Zinke stands out as a strong advocate of conservative measures in eclampsia. He records sixty-four cases treated by operative means, with a maternal mortality of 34.37 per cent., and a fetal mortality of 45 per cent.; while with conservative treatment, by means of veratrum viride, etc., he reduced his maternal mortality to 15.38 per cent. in his last twenty-four cases, but raised the fetal mortality to 53.38 per cent. Baker, Reamy, and Hirst also favor this general method. The latter claims that after the rupture of the membranes and elimination, easy delivery in eight hours is the rule. He uses large doses of veratrum viride. In Europe, the most remarkable results have been obtained by Stroganoff, who was able to present a mortality of less than 7 per cent. in about 400 cases, and a fetal mortality of 21.6 per cent.* Ahlfeld, had a mortality of 12 per cent. by conservatism; Pfannenstiel reports thirty-five cases without a death; Tweedy an 8.22 per cent. mortality.

* Even Stroganoff advises vaginal Cesarean in obstinate cases.

Bar and Commandeur, while inclining to the conservative viewpoint, state that when the patient seems to be getting worse despite medical treatment, and the cervix is still long and rigid, operative measures should be resorted to. Haultain, 1906-1910, in 14,845 cases showed a maternal mortality of 14 per cent., and in 2027 cases in Edinburgh, a mortality of 35 per cent. by conservatism. Seitz, in 390 collected cases, delivered by slow methods, found a maternal mortality of 28.9 per cent.

On the other hand, the radical school is represented in this country by such men as Peterson, Fry, Edgar, Cragin, DeLee, Newell. The radical treatment of eclampsia means active interference. The sooner the uterus is emptied after the first convulsion, or, in the nonconvulsive type, as soon after severe symptoms appear, the lower will be the maternal and fetal death rate. Hospital statistics in the United States show a maternal mortality ranging from 10 to 25 per cent. by active measures, and a fetal mortality ranging from 15 to 30 per cent. (excluding non-viable infants). In short series of cases the maternal mortality has been as low as 3 per cent. In Europe, where radicalism is more pronounced, strikingly low statistics have been obtained by vaginal hysterotomy. Fromme, by vaginal hysterotomy, had thirty-four cases with no deaths, with the early operation; Winter had twenty-two cases by vaginal section, with no deaths, when the operation was performed at once; and a 9 per cent. mortality after a moderate delay. Ferri, in eighty-two cases, had a 7 per cent. mortality by rapid delivery. Veit had thirty-three cases with one death, and Dührssen, in 112 cases, a 15 per cent. mortality when the operation was performed early. Liepmann shows a mortality of 2.8 per cent. by early delivery, and 25 per cent. by late delivery. Stande, by vaginal section, reduced his mortality from 31.2 per cent. to 17 per cent., and Van Horn, from 23 to 16 per cent. Zyskowitz, from 1904-1909, by immediate delivery obtained a 3 per cent. mortality, and Bumm, by vaginal hysterotomy, lowered his mortality 22 per cent. Von Albeck, by early delivery, reduced his maternal mortality from 44 per cent. to 14 per cent., and his infant mortality from 68 to 16 per cent. Seitz, in 615 collected cases, showed a mortality of 15.9 per cent. by rapid delivery.

From this array of figures I think we can conclude with some degree of assurance, that the scales tip in favor of early rapid delivery. It is worth noting, moreover, that on the whole the figures of European clinicians surpass those of this country.

Why this is true, it is somewhat difficult to say. It may depend upon two factors: First, the fact that the patients have not been delivered early enough; and, second, upon the possibility that the virulence of eclampsia varies in different countries. A number of observers are inclined to the latter view. This question was brought up in connection with the extraordinarily low mortality by conservative measures in the case of Stroganoff. More recently Haultain, 1911, stated that eclampsia had become a veritable scourge in Scotland and in certain sections of England. In Edinburgh, the eclamptic ratio has risen to 3 per cent.

If we take our stand with the majority and believe in the early emptying of the uterus—and I, for one, most decidedly do so—shall we empty the uterus by vaginal hysterotomy? I answer, yes, providing the local condition of the cervix calls for the operation, and the surroundings warrant the undertaking thereof. But the operation should be done *early*, in order to obtain a low mortality, and not only after eight or ten hours of waiting. Vaginal hysterotomy enables one to deliver rapidly and safely; to return the patient quickly to bed; and then to proceed comfortably with the usual medical lines of treatment. Aside from the lowering of the number of maternal deaths, the rapid early operation will probably reduce the fetal mortality from 10 to 15 per cent. Peterson, in a series of 1793 infants, has shown that by vaginal Cesarean, there was an infant mortality of 11.8 per cent. when the mother was delivered after one to three convulsions; 18.4 per cent., when the delivery only took place after four to eleven convulsions; and 30.5 per cent. when delivery occurred after ten convulsions. In those cases in which the manual dilatation can be safely performed, this should by all means be the delivery of choice. Please note this. Over-enthusiasm for a particular operation should not interfere with good judgment and common sense; but manual dilatation, excepting in cervixes softened and flattened out, has been shown by Bonnain to give extensive lacerations in 16 per cent. of the cases, and by Bar in 30 per cent. of the cases. As to abdominal Cesarean section, I would say that the operation in eclampsia cannot be compared to the vaginal method of delivery. This presupposes an absence of pelvic dystocia. The mortality with the former operation is of necessity higher, although the fetal death rate will be somewhat less than with the vaginal operation. Abdominal section was early advocated by Halbertsma in this condition. Everke, in 1900, collected forty-one cases with

51 per cent. mortality; Sippel, in 1902, forty cases, with 60 per cent. mortality. Of late, in shorter series, the mortality has been reduced to about 20 per cent., but this percentage is still much too high.

2. *Accidental Hemorrhage*.—Of all obstetrical complications of pregnancy, perhaps no other is to be more dreaded than this one. The severe cases show a high mortality, both for mother and child. The gross mortality in the bad cases is 32.2 per cent. according to Holmes, and 50 per cent. according to Goodell. The fetal mortality varies from 94.4 per cent. to 85.8 per cent.

The *one* method of saving the mothers in these cases is by rapidly emptying the uterus. The patient when first seen is usually suffering from both shock and hemorrhage; the cervix is likely to be hard and difficult to dilate. No other operation is so well adapted to the conditions present as a vaginal hysterotomy. The bleeding, if external, will make the operation difficult, perhaps, but the essential steps can be taken rapidly, and the child delivered in a very few minutes.

3. *Shall we use this Operation in Prolapsed Cord?*—As a general proposition, I answer, no. On the other hand, in the case of a prolapsed cord that cannot easily be replaced, and a cervix that cannot easily be dilated, I believe that this operation will prove a life-saving. The death rate of the child is high in prolapse of the cord, especially in primiparæ. The long manipulation of the cord, even when finally replaced, is sufficient to markedly lower the child's chances of life. As yet but few men have tried the operation in this complication, but Döderlein, Dührssen, and Seitz speak highly in favor of it. Certainly, it would seem that our hesitation to adopt a new procedure should vanish, at least to a degree, when it is recalled that the average fetal death rate, by the usual methods of treatment, is about 50 per cent. This surely is much too high a figure.

Knapp found at the New York Lying-In Hospital in 624 cases of prolapsed cord, a fetal mortality of 53.2 per cent.

4. In certain exceptional cases in which the condition of the mother demands a short labor, and in certain cases in which the mother's condition becomes rapidly desperate—as in some unusual cases of heart disease and tuberculosis—vaginal hysterotomy for the sake of the child can be quickly and safely performed, and with little explanation to the family. Under such conditions, it is less exciting to the patient than the abdominal route, and can be performed under lighter anesthesia.

5. *Placenta Previa*.—Vaginal hysterotomy in placenta previa has so far gained but few adherents. It is widely condemned in England, France, and, to a lesser degree, in Germany. In this country it has attracted little attention, having been for the most part simply brushed aside, as being unsound, without having been accorded a fair trial. An operation such as this can only be accepted if it can give results superior to the older methods of treatment. This is not an easy matter to accomplish in placenta previa, as many clinicians are able to present a low maternal mortality by conservative methods. The fetal mortality, however, by the slow methods, is generally much too high.

Döderlein to-day is the great advocate of vaginal hysterotomy in this condition. He reports thirty-four consecutive cases with one maternal death. This case died of sepsis, and had been infected before admission to the clinic. Fifteen of the babies were nonviable; three of the other sixteen were dead on admission. The others were all saved. Döderlein believes that with the Braxton-Hicks version and extraction the cervix is frequently badly torn, and that the fetal mortality is needlessly high. He employs the operation in all types of severe or moderately severe placenta previa. Perfect light, good assistance and rapid work are necessary.

Bumm and Krönig have also been strong advocates of the operation in placenta previa, but both gave it up after a few bad results. The latter were due to insufficient room, with consequent tearing of the uterus while extracting the after-coming head. Despite a few unfavorable results, their statistics by the use of vaginal hysterotomy still surpass many of the results gained by conservatism. Dührssen, Henkel, Büttner, Hofmeier, Gauss, G. Winter, Thies, and a few others have likewise adopted the operation in certain cases. Döderlein believes that the operation will markedly lower the death rate of both mother and child, providing it is done early. Henkel does not consider it particularly difficult in placenta previa. He thinks that by the previous injection of ergot, and the grasping of the uterine vessels with clamps, the operation can be made relatively safe.

Mason and Williams—Boston Lying-In Hospital—while not reporting cases of placenta previa treated by vaginal hysterotomy, state their belief that in complete placenta previa rapid dilatation and version will save more mothers and more babies than the slower method. In a series of 155 cases, with fifty-five complete

cases, these was a 3.2 per cent. mortality when delivery occurred early, and a 23.6 per cent. mortality, when late.

In opposition to this rapid method of delivery, and especially to vaginal Cesarean section, we find arrayed a great body of clinicians who adhere ardently to conservative methods.

The following results will give a fairly clear idea of what averages can be expected in good hospitals. I am presenting, for the purpose of this discussion, general figures only and therefore have not attempted to separate the infant mortality by the Braxton-Hicks version, from that following the use of rubber bags and internal podalic version.

	Cases.	Maternal deaths.	Fetal deaths. (per cent.)
Sigwart.....	121	1	
Ohlshausen (Weischer).....	346	7.4 to 8.5 per cent.	74.1 to 46.8
Strausmann.....	229	6.9 per cent.	
Schauta.....	342	5.8 per cent.	
DeLee.....	74	3. per cent.	
Mouchotte.....	183	2.18 per cent.	44.8
Gussakow.....	137	5.18 per cent.	64.9
Gussew.....	486	11.25 per cent.	62.
Edgar.....	40	7.5 per cent.	32.25
Cragin.....	49 } 14 complete	14.2 per cent.	
	35 incomplete	5.7 per cent.	
Fry.....	38 (personal)	1 death	
Fry.....	161 (collected case)	3.1 per cent.	

In general, we may say that the gross fetal mortality ranges between 45 and 65 per cent. and excluding nonviable infants, between 25 and 35 per cent.

In the light of these figures, it is not strange that there should be strong opposition to a radical operation in placenta previa. On close study of the subject, however, we will be forced to admit that the fetal mortality is too high, and that the mortality in central placenta previa should show some improvement. We may condemn at once the operative handling of central placenta previa from below, but should we be too severe in our criticism until we have had more experience in this new method of handling these cases? May it not be possible to save more maternal lives by vaginal hysterotomy in carefully selected cases? May we not at least save many patients a great amount of blood and save both the patient and her family hours of tense solicitude?

I myself believe that vaginal hysterotomy has a field in placenta previa, but this field is a very *limited* one. There are cases in which the bleeding is severe, and yet the cervix is not really soft or flattened out. The dilating of these cases, when

not in labor, is often tedious, and the hours of delay are usually fraught with real danger to both mother and child. Under such circumstances, at or near term, a vaginal hysterotomy is well worth considering, both because of the possibility of its reducing the maternal mortality, and the great probability of its markedly reducing the number of fetal deaths. This statement may sound radical, even foolhardy, to you now, but with wider general experience with the operation, I venture to say that *even here* it may some day find its advocates. A number of men are now advocating the abdominal Cesarean section in this condition, as E. P. Davis, Newell, Fry, Markoe, but no one in this country has, so far, had any extensive experience with this operation in placenta previa.

The abdominal operation is considerably easier than the vaginal, and will give a slightly lower fetal mortality, but I am inclined to believe that in good hands the vaginal operation will give a lower maternal death rate, excepting in cases seen before any appreciable loss of blood has taken place, and in which infection is probably absent. Dührssen's new method of first introducing a rubber bag within the cervix, drawing the latter down as far as possible by tractions on the bag, and then performing the vaginal hysterotomy, appears to me to be especially valuable in central placenta previa. A minimum amount of blood will be lost, the operation can be performed rapidly, and I think with reasonable safety.

6. *Vaginal Hysterotomy in Cancer of the Cervix.*—Inasmuch as the general question of the vaginal *versus* the abdominal method of operation in cancer of the cervix is still so unsettled, it is clearly impossible to draw any positive conclusions in regard to the best way of handling cases of pregnancy, at term or in the late months of pregnancy, when complicated by this condition. Just as it is imperative in *operable cases*, however, when operating from above, to do an hysterectomy following a Cesarean section, so it is equally important when performing a vaginal hysterotomy to likewise remove the uterus. Vaginal hysterotomy is impracticable if the involvement of the cervix is considerable. Williams, of Boston, collected fifty-three vaginal Cesareans, followed by hysterectomy, with four maternal deaths, but the fetal mortality during the last two months was 34 per cent., and of these operated on at term, 16 $\frac{2}{3}$ per cent. Out of 12 patients whose condition was known one year after operation, eight showed recurrences. In his study, he found twenty-

four abdominal Cesareans followed by hysterectomy, at or near term, with four maternal deaths. All the children were born alive, excepting two that were macerated. Although statistics seem to point toward a lower operative mortality by the vaginal route, still the late results promise to be decidedly better by the Wertheim operation.

In *inoperable carcinoma* of the cervix, vaginal hysterotomy is, I think, not advisable. When the child is alive and near term, unless the labor promises with a fair test to proceed fairly normal, a conservative Cesarean section is best. When the child is dead, and labor calls for assistance, either a manual dilatation or Dührssen's incisions, followed by craniotomy, should be the operation of choice.

Williams, from 1896-1909, found thirty-one inoperable cases delivered through the vagina, with a maternal mortality of 13 per cent. and a fetal of 38 per cent.; ten conservative Cesarean sections with two deaths; and twelve Porro operations, with seven deaths. There was no mortality in the abdominal operations.

Dangers to the Child in Vaginal Hysterotomy.—These depend, first, upon the condition demanding the operation; second, upon insufficient preliminary dilatation of the pelvic floor; third, insufficient length of the uterine incision; and, fourth, upon deep anesthesia.

Immediate Dangers to the Mother. First, *Injury to Bladder.*—According to many observers, this complication is rare. Sloughing however does at times occur from either too extensive separation of the bladder or from a slight injury in the presence of a vaginal discharge. Petersen, in 530 collected cases, found bladder injury in nine. Hauch, in 237 cases, estimated that the bladder was injured in about 5 per cent. of the cases. This figure seems unnecessarily high.

Second, *Hemorrhage.*—This, as a rule, is slight. If the operation is performed carefully and the incision or incisions are long enough to deliver the head without further tearing of the uterine muscle. The relatively few cases in skilled hands of severe hemorrhage have been due to insufficient room with consequent further tearing into the broad ligament. When a marked axial rotation of the uterus exists, it is possible, occasionally, even with care, to injure one broad ligament. Severe hemorrhage probably does not occur in more than 1 per cent. of the cases.

Third, *The Risk of Sepsis.*—In *clean* cases, with due aseptic

precautions, this risk is very slight. The operation should be avoided, if possible, in *septic* cases. It has been shown abroad that more cases become septic with the posterior incision than with the anterior one, because of the greater chance of opening the peritoneum with the former and the greater chance of colon bacillus infection.

Fourth, *Thrombophlebitis*.—This is probably no more common than with a manual dilatation of the cervix.

Late Maternal Results.—First, *persistent fistulæ*; second, the effect of the operation upon *subsequent labors* is still somewhat uncertain. So far as I am aware, no serious results have yet been published. A scar in the uterine tissue is always a scar, whether in the upper or lower zone. It always should arouse some little anxiety in labor, but I for one, in the absence of pelvic dystocia, should prefer to take my chances with a scar in the lower zone rather than with one at the fundus. This opinion I share with Dührssen and Labhardt. At the present stage of our knowledge it is safe to say that while all such patients should be carefully watched in subsequent labors, still the danger of rupture must be slight.

Conclusions.—In vaginal hysterotomy we have an operation that will in competent hands and under proper conditions tend to markedly lessen both maternal and infant mortality in a number of the more serious complications of pregnancy. We are all aware of the part played by the rigid cervix in raising the percentage of both maternal and fetal deaths. According to Seitz, 65 per cent. of still-births during labor in Germany, died from trouble with the cervical soft parts; 35 per cent. directly, and 30 per cent. secondarily to other complications, as eclampsia, placenta previa, etc. In Germany alone 16,000 infants die each year from primary cervical difficulties. These figures are startling, and surely call for improvement in our obstetrical technic, in at least some directions. The indications, then, as they appear to me, will not arise frequently, excepting in large clinics with abundant material. When, however, indications such as I have outlined do appear, the operation will prove of great value. We should ever remember the prerequisites of success, viz., skill in vaginal surgery, proper surroundings, abundance of good light, and at least two competent assistants.

CASE REPORTS.

Eclampsia.

CASE I.—Mrs. S., i-para, age twenty-five, was brought to me in June, 1910, with the history of having had several convulsions. She was eight months pregnant and seemed to be very sick. Fetal heart 160; vertex presentation.

The cervix was long, tough and undilated. With the usual aseptic precautions a No. 1 Voorhees bag was introduced after the use of a Goodell dilator. The regular eclamptic treatment (medical) was then begun. The patient developed *no* uterine contractions; as a result, after a few hours of delay, I decided to deliver the child by a "vaginal hysterotomy." The operation was performed under light ether narcosis. After separating the bladder and retracting it, an anterior incision, about 12 cm. in length, was made through the cervix up into the lower uterine zone. The upper end of the incision had to be made by the sense of touch. The child was delivered by version. It was alive and weighed 2500 grams. After extracting at once the placenta, the uterus was drawn down as far as possible with strong volsella forceps and the incision closed with interrupted sutures of No. 3 chromic gut. The vaginal mucosa was now united with a continuous No. 2 chromic gut suture, allowing space for a small drain. The bleeding was moderately profuse, so that the uterus was tamponed with 5 per cent. iodoform gauze. This bleeding came only in part, from the wound surfaces.

The patient had a convulsion after delivery, and then rallied well. Medical treatment was continued. The patient's temperature was 101.4° on admission; this was due to the toxemia. This came down, by the fourth day, practically to the normal, but on the fifth day a right-sided pyelitis developed which lasted for four days. After that convalescence was normal, and patient insisted on returning to her home on the fourteenth day.

CASE II.—Mrs. E. C., i-para, age twenty-three, was brought to us June 26, 1910, in active *eclampsia*. Patient had a number of convulsions before I saw her; she was about seven months along. The child was dead. The cervix was very long and rigid and closed. It seemed wise to deliver at once, as the general condition was bad and as it is extremely difficult to start up uterine contractions quickly in such cases.

With due preparation and under light ether narcosis, a "vaginal hysterotomy" was performed. An anterior incision was made about 12 cm. in length. An internal podalic version was performed and the child easily extracted. There was little bleeding. In suturing this case, there was considerable difficulty in introducing the upper three sutures, as the uterus

was hard to draw down. No drain was introduced into the uterovesical space. The mucosa was therefore entirely closed with a running stitch of No. 2 chromic gut. The uterus was tamponed with 5 per cent. gauze, as in all of our operations of this type. The patient voided after the second day. Packing was removed at the end of twenty-four hours. Convalescence was rapid and afebrile. Patient went home on the fourteenth day. Local pelvic condition good.

CASE III.—Patient was an i-para, aged twenty-seven, about eight months pregnant. She developed *eclampsia* out of a clear sky in Jan., 1911, and became rapidly extremely toxic, having convulsion after convulsion, despite great watchfulness. I saw her with Dr. Page, of White Plains, who had himself only been called in a short time before. The child was dead; the cervix was 4 cm. long, rigid, and only admitted the tip of one finger. With these conditions present, it seemed wise to operate at once and a "vaginal hysterotomy" was performed (three doctors, one nurse).

As the cervix was long and closed, a long anterior incision was made. The uterus was so contracted that a version was impossible. We see this condition in some cases of *eclampsia*, despite deep anesthesia and despite the fact that the patient is not in labor. The patient being in bad condition, a basiotripsy was performed (the child was already dead). The bleeding was moderate. The uterovesical space was closed without drainage, after the long uterine incision had been united with a No. 3 chromic gut. There were two convulsions after delivery and then a smooth convalescence set in.

CASE IV.—*Severe accidental hemorrhage*. Mrs. McK., age, thirty-one, ix-para, was seen by me April 28, 1910. She was in bad condition from shock and hemorrhage from a normally situated placenta. The child was a vertex presentation and alive. The amount of blood lost had been great. The cervix was closed and rigid from old scar tissue. It could not be dilated without severe lacerations. I felt an immediate delivery was imperative and did, therefore, a vaginal hysterotomy. Owing to continuous bleeding, the operation had to be performed very rapidly. On account of the large size of the head and as the uterus was riding high, the incision into the lower uterine zone was difficult. The peritoneal pouch was opened. Only an anterior incision was made, as this was less complicated in this particular case. A version was performed and a 3900 gm. living child extracted. The suturing was done very rapidly after a thorough tamponade of the uterus with gauze (5 per cent. iodoform). A thin strip of gauze was also passed into the uterovesical space, as there was considerable oozing at this site.

Patient voided on the second day, and the packing was removed after forty-eight hours. Recovery uneventful. There

was slight absorption from the cervix, with slight febrile reaction for a few days; but the case had been tamponed in the tenement house before coming to us.

CASE V.—*Severe accidental hemorrhage.* This patient, Mrs. M., was seen by me on October, 1911. She was a private case at Port Washington and the wife of a physician. Three years before this time I had delivered her at the seventh month of a live baby, in the presence of repeated severe hemorrhages. During the present pregnancy, at the sixth month, there was one severe hemorrhage. The patient did not take favorably to my advice and continued after ten days to be as active as her strength would allow. She went to term without further bleeding. At term, as she was out of town and as I feared another hemorrhage in labor, I deemed it best to actually start her in labor and thus be enabled to attend her throughout the confinement. In consequence, labor was started with a Voorhees bag. Pains rapidly set in. After a few hours the bag came through the cervix. Before removing the bag, I placed the patient in the lithotomy position on the table, as I feared that there might have been some bleeding back of the bag and I desired to be ready for any emergency. I feared the bleeding in question, 1, because of the character of the pain—like retroplacental hemorrhage pain, 2, because of the increase in rate of both maternal and fetal pulses.

Sure enough, just as we had the patient ready for the examination there was a furious hemorrhage. The cervix was three fingers dilated, but tough and not at all shortened. The child was large. I was forced, in order to save the mother, to perform as quickly as I could, and with poor assistance, a vaginal hysterotomy. The bleeding was so great and sudden that it killed the baby which weighed 8 pounds, and all but carried off the mother. The child was rapidly extracted, the patient tightly packed with 5 per cent. iodoform gauze. The wound was sutured rapidly. The patient was fairly low for two days then rallied well and had a smooth convalescence. The bladder fortunately escaped injury.

CASE VI.—*Central placenta previa.* This patient, an i-para, was seen by me in the early fall of 1911, in a private house. She was near term. The child was large and alive. When the patient went into labor there was moderate bleeding. On examination there was found a "placenta previa centralis"; the cervix was one finger dilated and much longer and tougher than we find in such cases, as a rule. I introduced a bag and waited for further progress of labor. The patient was fortunately in good condition. In five hours the bag came through. There was profuse hemorrhage; the cervix was three fingers dilated. The patient was placed in the lithotomy position on a table. I decided, despite the surroundings, to do a vaginal hysterotomy, for the reason that I felt that I would be more likely to get a live child (and a live child was most essential) by this method

than by manual dilatation of the cervix and the slow extraction of the child. With the manual dilatation, a rather slow extraction would be necessary, owing to the likelihood of the large after-coming head becoming caught in the cervical ring. Without a rapid extraction the child would be killed owing to the wide separation of placenta. I had one doctor and three nurses to assist me. Fortunately the outcome for both mother and child was most satisfactory. The procedure is risky, but I felt it proper to take the very slight additional chance of danger to the mother, for the sake of the child for the reasons mentioned above.

CASE VII.—*Accidental hemorrhage.* Mrs. B. M., i-para, aged twenty-five, was brought to us at eight and a half months, with the history of having been bleeding more or less constantly for twenty-four hours. When I first saw her her condition was really grave and she was evidently losing ground each hour. The pulse was 150 and very soft; the hemoglobin 50 per cent. As soon as she came under my observation, she was placed on the table in the lithotomy position, for immediate delivery, as nothing but a rapid delivery could save the mother. The child strangely enough, was still alive. Just as I was about to examine the patient, prior to delivery, a sudden external hemorrhage took place. Nothing can stop such bleeding but immediate delivery and inasmuch as the cervix was tough as gristle, and still long, although dilated to the size of a silver dollar, vaginal Cesarean section was very hurriedly performed. The child was delivered in five minutes and alive. The placenta and membranes were quickly removed and the uterus tamponed with 5 per cent. iodoform gauze. A few No. 3 chromic gut sutures were introduced uniting the cut uterine edges; the vagina was further packed and a saline intravenous infusion given. Despite all effort, the patient died of loss of blood and shock within a few hours.

N.B.—This outcome was not the fault of the type of operation, but was due to tardy interference. The patient could have easily been saved by the operation a few hours earlier. No other operation would have been as good.

CASE VIII.—*Threatened eclampsia or eclampsia without convulsions.* Mrs. B., i-para, age twenty-four, eight months pregnant, came to me as a private patient at the hospital March 4, 1909. The urine boiled almost solid with albumin; there were many casts of all varieties; there was marked decrease in quantity, etc. The blood-pressure was 230, there was beginning amblyopia. General anasarca. The patient's condition seemed threatening. There was a moderate yellowish vaginal discharge. The above symptoms were not lessened by conservative treatment at home by another physician. I decided naturally to deliver the woman. The cervix was long, hard, undilated. With a metal dilator, under very careful asepsis, the cervical canal was dilated enough to allow the introduction of a small-sized

Voorhees bag. Medical treatment was continued. After eight hours of ineffectual pains, and the patient's condition becoming more grave, I decided to empty the uterus at once. The bag had accomplished little or nothing. Manual dilatation could not be done; the cervix could of course be torn. This I did not wish to do and I performed therefore a vaginal hysterotomy. An anterior incision was used and the child extracted by a version. The child weighed 2800 grams. The suturing was done with great care, but in some way, the bladder must have been damaged slightly, probably from careless retraction, for on the fifth day, a vesicovaginal fistula appeared. This was no doubt brought about by contamination from the foul discharges the patient had at the time of delivery. A bad cystitis resulted which required three weeks to overcome. The fistula was closed later by another operator. This case is the only one that I have encountered, up to the writing of this paper, in which there has been any damage from the operation itself.

CASE IX.—*Eclampsia*. Mrs. H. B., age thirty-eight, vi-para, was brought to us Dec. 17, 1909, in active eclampsia. She was seven months pregnant. The cervix was tough, long and undilated. Immediate delivery was undertaken. Attempts were made with the Goddell dilator and the fingers to dilate the cervix, but this was ineffectual. I decided, therefore, to perform a vaginal Cesarean section. An anterior incision was used and the child delivered by version. The uterine wound was closed with No. 3 chromic gut sutures and a small wick of gauze placed in the uterovesical space, as there was moderate oozing at this site. Convalescence was rapid after delivery. Both mother and child did well.

CASE X.—*Partial Ventro-fixation*. Mrs. R., v-para, age forty-two, was admitted to the hospital, as a private case, in 1907. Patient was at term. There were marked varicosities of the vulva. The cervix was long, but rather soft and was two fingers' dilated. The child was of good size, the head was in the right iliacfossa. The anterior lower segment over a considerable area was thickened in the manner seen after a true ventral fixation of the uterus. Inasmuch, however, as the patient's operation had not resulted in *absolute fixation* of the uterus, the dystocia was not extreme. When the patient went into labor, she progressed well up to a dilatation of the cervix of about 5 cm. in diameter; then, despite hard pains, no further advance was made. This failure to further dilate was due (a) to the relative dystocia from the highly thickened muscle of the lower anterior zone, (b) to the poor engagement of the fetal head, due to the improper direction of the uterine impulses. Manual dilatation was impossible. I decided to try a vaginal hysterotomy. (This was performed about fourteen hours after the onset of labor.) An anterior incision was employed, passing well up into the thickened zone. When plenty of room had been gained, a version was done and a living child extracted.

The suturing was not difficult in this case. Both mother and child progressed satisfactorily.

CASE XI.—Mrs. B., aged thirty-eight, i-para, referred by Dr. Ransom S. Hooker, was started in labor by means of a No. 1 Voorhees bag, May 22, 1910. She was within a few days of the full reckoning. The pelvis was a just minor one with some contraction of the outlet. The cervix was long, rigid and unyielding. The child was a vertex presentation and was estimated at about 7 pounds. I should have induced labor ten days earlier, but thought that by the delay, the cervix would soften and thin out. The patient had always been athletic and had spent much of her time on horseback. After twenty-four hours of good hard labor, the bag came through although the cervix had softened and thinned out but little. A second bag was introduced. The pains continued, but there was little further dilatation. Realizing after a few hours longer, that I was dealing with a cervix that would not yield to conservative measures. I attempted to dilate manually. A little progress was made, but in such cases we find *at times*, that *not* only the cervix proper, but the lower portion of the lower uterine zone too, acts as an impediment; I therefore performed an anterior vaginal hysterotomy, applied forceps and with some difficulty delivered the patient of a 7 1/2 pound live healthy baby. The uterine wound was about 9 cm. long and was fairly readily sutured. No packing was used. Convalescence was normal.

N. B.—I feel assured that this operation saved the child's life. It was only done after careful weighing of the pros and cons. There were two doctors and two nurses on the case. The operation was performed in a private house.

CASE XII.—Mrs. F., aged thirty-four, i-para, was seen by me Dec. 24, 1911, in consultation with Dr. Roper, at the New York Hospital. The patient was within a few days of term. For one week there had been a few ocular symptoms and slight edema of the ankles. For three days there had been *complete loss of vision*, with gradually increasing edema. The urine suddenly began to show a great many red blood cells, some free blood, some granular casts and a slight amount of albumin. The total amount of urine was considerably decreased in quantity. The blood pressure was around 180. The child was large, but inactive. The fetal heart was not strong and varied between 150 and 200.

On December 24, she was brought to town; I saw her that evening and considered her a very sick woman. The urine had not been improved by irrigations, diet, etc. Blood pressure went up to 240. Vision absolutely gone. A bag was introduced that evening after dilatation with a Goddell dilator. Eclamptic treatment was given. Throughout that night the blood pressure and pulse rate varied but little. The tension went down to 200, but soon went up again. The following morning there had been nothing accomplished either by the bag or by the medical

treatment. The patient impressed me, in the light of a few previous cases of this type, as too sick to employ further delay. We therefore decided on the emptying of the uterus. The bag could not be pulled through without letting the water out. The cervix was fully 4 cm. long, absolutely unyielding. The whole uterus was riding high. The fetal heart was scarcely heard. With Dr. Creavey as anesthetist and with plenty of good assistance, I performed an anterior vaginal hysterotomy. The case was difficult as the child was large and the field of operation so high up. After the version I was forced to do a *slow* extraction of the child, as the uterus was so flabby, I feared hemorrhage and as the perineum—despite my preliminary dilatation—was very rigid. The child was too far gone before the operation to stand the anesthetic—although this was beautifully given. The suturing was readily accomplished with the good assistance at hand. The mother as far as the operation went, made a good recovery. She was very low at the end of the operation, but rallied quickly. Her eyesight came back slowly after the fourth day.

N. B.—This case of rather sudden complete loss of vision is infrequently seen, and is a serious complication of pregnancy that needs active interference.

CASE XIII.—Mrs. P., age twenty-eight, i-para, eight months pregnant, was sent to me by Dr. Titus of New Rochelle, in April, 1911. The patient had an active syphilis and was now also suffering from a very severe albuminuria with threatened eclampsia. No fetal heart had been heard for two days. Despite the death of the fetus and despite conservative medical measures, the patient's symptoms were becoming each day more severe. The cervix was very hard, closed, and about 3 1/2 cm. long. Labor was started with a No. 1 Voorhees bag. Despite early active uterine contractions the patient seemed unable to dilate the cervix herself at the end of fourteen hours, more than the diameter of a silver half-dollar. The cervix continued long and but little shortened. The patient's blood tension was rising from 200 to 230; there was beginning amblyopia. I decided then that the safest way to deliver her, was by a vaginal hysterotomy. This was forthwith performed by the anterior method. The wounds were united with chromic gut. No packing was used. The operation was not troublesome.

The patient convalesced slowly. Active treatment for the syphilis was delayed for several weeks.

CASE XIV.—*Eclampsia*. Mrs. K., i-para, seven and one-half months pregnant, was seen by me with Dr. Page of White Plains, on January 20, 1911. The patient was having frequent, severe eclamptic convulsions. Although the onset of the attack was sudden and without warning, the patient rapidly became deeply

toxic, so that when I first saw her about eight hours after the first convulsion, the prognosis seemed bad. With the help of two doctors and one nurse, vaginal hysterotomy was performed as soon as the necessary preparation had been made. During the operation, which was a rapid one, the patient's condition became critical, so that the suturing had to be done without anesthesia. The child was small, but alive, and was doing well, when last I heard of it.

The mother had three convulsions after delivery and after that gradually improved under ordinary measures for several days. On the sixth day we thought she was going to get well, but quite unexpectedly, the following day, there was another convulsion with rapid sinking, and death ensued a few hours later.

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 155 EAST SEVENTIETH STREET.
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VAGINAL CESAREAN SECTION AND ITS LIMITATIONS, PARTICULARLY IN ECLAMPSIA.*

BY

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A PERIOD of sixteen years has elapsed since Dührssen first performed the operation to which he gave the name of "vaginal Cesarean section." It was carried out in a patient in whom he had previously done vaginal fixation for uterine prolapse. The woman subsequently became pregnant and it was found impossible to deliver her by the ordinary means on account of the dystocia caused by the abnormal fixation of the uterus. As Dührssen in an analogous case had been compelled to do a craniotomy, he decided to empty the uterus in this instance by deep incisions of the anterior and posterior lips of the cervix and lower uterine segments. He was prompted to this operation by his experience in removing submucous fibroids by the vaginal route, where he had exposed the tumor by means of extended

* Read in part at a meeting of the New York Obstetrical Society, March 12, 1912.

sagittal incisions in the cervix. The delivery in this case was completed by means of a podalic version and the woman and the child made a good recovery. The incisions were carried into the lower uterine segment and the bladder pushed upward and kept out of the field by means of a speculum. The closure was made with interrupted catgut sutures, including the opening which had accidentally been made into the peritoneum. The patient was presented about a month later before the Congress of the German Surgical Society and examined by a number of the prominent obstetricians and gynecologists present.

Dührssen in claiming that he was the originator of this form of delivery, acknowledged that he had been guided in this procedure by the previous recommendations of Doyen, Czerni and Veit, who all proposed and carried out exposure of submucous fibroids by incision through the anterior lip of the cervix and the anterior vaginal fornix. Since Dührssen proposed this operation it has been continuously employed by many operators with very few modifications and must be regarded as one of the essential and classic obstetric methods developed in modern times. Previous to the actual operation as here noted, Dührssen had referred to such a method in an article on the treatment of eclampsia published a short time before, in which he stated that in this condition a rapid emptying of the uterus could be secured by median incision of the anterior lip of the cervix and the lower uterine segment. After this he added another indication in a subsequent paper where he referred to the value of such a procedure in dystocia due to vaginal fixation of the uterus. Although thoroughly impressed with the value of the procedure, Dührssen seems to have hesitated in recommending its general adoption because he distinctly states that the operation is only to be done in a hospital with trained assistants, and is only indicated in those cases, where in the presence of a closed and nondilatable cervix, serious danger is present for the mother or in rarer cases for the child. He urged that the exposure of the anterior and posterior segments of the lower uterine wall should be sufficiently complete to permit the incisions being made under the guidance of the eye, rather than by the sense of touch.

The operation of vaginal Cesarean section must be regarded now, as it was originally regarded by Dührssen, in the nature of direct and radical surgical interference and as expressing the dominant influence on modern obstetrics by the foremost surgeons of that period. In this connection Dührssen distinctly

states that it was Czerni's total vaginal extirpation of the carcinomatous uterus and of his vaginal myomectomy which led him to propose the operation with which his name is so largely associated. Dührssen was also prompted by the desire to find a substitute for the abdominal Cesarean section in selected cases, in order to overcome certain objections to this operation of which he thought the principal one was the possibility of the production of adhesions between the wound and the intestines or the possibility of hernia. He considered that his vaginal Cesarean section was an efficient substitute as it provided a sufficiently wide opening of the uterus through which the child could be readily extracted without invading the peritoneum. As preliminary to this, however, in contrast to the classical abdominal operation, it is necessary that the child must be able to pass through the birth canal and it is therefore contraindicated if any degree of pelvic contraction exists with less than a true conjugate of 8 cm. From his original case Dührssen concluded that the dangers in a carefully conducted operation and in the presence of aseptic conditions of the genital tract are of a minimum degree and that this freedom from danger depended largely on the fact that the operation may be conducted extraperitoneally. Even where there is a suspicion of an infection present he considered that this procedure offered more favorable chances for recovery than where the peritoneal cavity was opened in doing the operation. The chances of severe hemorrhage were also believed to be much reduced in the vaginal Cesarean section as compared with the abdominal. Dührssen finally summarized the indication for the vaginal Cesarean operation as follows:

1. Abnormalities of the cervix and the lower uterine segment, including carcinoma of the cervix, myoma of the cervix and lower segment of the uterus, rigidity of the entire cervix, stenosis of the cervix and the adjoining portions of the vagina, and a partial sacculated dilatation of the lower uterine segment.

2. Conditions endangering the life of the mother which may be done away with or improved by emptying the uterus, including diseases of the respiratory and circulatory apparatus, diseases of the kidneys and serious conditions in the mother, which are known to result in death and in which operation is done merely in the interests of the child.

Vaginal Cesarean section soon became popular because it was an operation easily begun, although not always so easily completed. It seemed to be particularly applicable in cases of

eclampsia where the alarming character of the disease apparently called for radical procedures looking forward to the immediate emptying of the uterus. An enormous number of vaginal Cesarean sections are now on record, one operator having collected a series of over 500 with apparently brilliant results. Let us pay some regard, however, to those who entertain the opposite view, who believe that rapid delivery is not the *sine qua* in the successful treatment of this condition.

The following extracts from the recent literature on the subject of eclampsia show that there is by no means a unanimity of opinion as regards the value or importance of rapid delivery, aside from measures directed more particularly to the natural eliminative processes. These references do not include all that might be adduced, but I have simply made a general selection from a large number of writers. Thus Lichenstein (*Archiv für Gynäkologie*, vol. xcv, No. 1) presents a review of 409 recent cases of eclampsia from European clinics in which the material is carefully tabulated and the results viewed from various standpoints. Attention is called to the fact that the later compilations of cases show that the convulsions cease after delivery in only one-third of all the cases and not in from 50 per cent. to 90 per cent. as many of the older and some modern records claim. It is also shown by this writer that if the mortality is considered from various standpoints it seemed to be practically as high with one form of delivery as with another and that the amount of blood lost is believed to be the immediate and deciding factor in the outcome. Thus, Lichenstein claims to have observed that the women whose convulsions ceased after delivery had lost one-half again as much blood as those women whose convulsions came on during the puerperium. This author likewise claims to have shown that venesection arrested the convulsions occurring after delivery and that the conclusion seems imperative, therefore, that causal treatment of eclampsia is not by emptying the uterus, but by withdrawing a certain amount of blood, which, better than anything else, relieves the mother's organism of the toxins causing the trouble. After delivery venesection is advised as a routine procedure and Lichenstein recommends it preliminary to delivery, as this may render it unnecessary to hasten the latter. His tables also seem to show that spontaneous recovery is possible and that pregnancy may go on to term without further convulsions. It is further claimed that these statistics testify against an ovarian or placental origin for the eclampsia.

Zangemeister (*Deutsche medizinische Wochenschrift*, October 12, 1911) advances the theory that eclampsia is a kind of reflex epilepsy and is the result of pressure from edema on the brain, which is enormously increased during the strain of each labor pain and which he claims may be relieved by reducing the pressure through the agency of prompt trephining. Zangemeister had the courage of his convictions and actually did this operation in three severe cases of eclampsia persisting after delivery, two of which patients recovered and the third succumbed on the sixth day, although the eclampsia had long subsided. In the latter case the dura had been sutured again after the operation, and it is possible that the edema recurred. This must be regarded as rather an extreme form of treatment and may be classed with that which depends on a complete amputation of the breasts for the subsidence of the convulsions.

A somewhat similar experience is published by Bataski (*Ann. de Gyn. et d'Obstetr.*, Jan., 1912), who reports three cases of eclampsia successfully treated by lumbar puncture.

Mayer (*Zentralblatt für Gynäkologie*, No. 37, 1911) has approached the subject from an entirely different point of view by combating the toxemia with intravenous injections of serum from a normal pregnant woman. In one of his cases the eclamptic convulsions came on during the sixth month and after three injections of 20 c.c. each, a spontaneous delivery resulted about nine hours after the last convulsion, no other remedies being given. In another class of cases of a less severe type, equally good results were obtained by the same means in relieving the evidences of intoxication.

To Stroganoff, must largely be given the credit for having developed the method of treating eclampsia in which morphine and chloral are employed for their sedative effects, and although his suggestions were widely criticised, his good results have been fully confirmed by other observers. It is quite true that not many have adopted the method, but may it not be due to the fact that it requires more patience than the radical methods of treatment which are favored by many. In a radical surgical delivery one factor of the case at least is decided in a very few minutes, whereas the conservative methods of treatment require prolonged attendance and expert observation. Comparing Stroganoff's statistics with those of the "surgical obstetricians," we find that the results are apparently as good, if not better, and even where the method was employed with scepticism, as in

Leopold's Clinic at Dresden, the outcome was unexpectedly favorable. An instance of these good results may be gathered from a paper by Roth (*Archiv für Gynäkologie*, No. 2, 1910) who reports a series of thirty-one cases of eclampsia with convulsions, in which Stroganoff's method was employed. The convulsions subsided in every case and the patients went on and were delivered by the usual methods and living children secured. Only one of these women died and the autopsy showed that pneumonia was the cause of death.

It is quite generally believed that in eclampsia the prognosis for both mother and child becomes more grave as the interval is prolonged between the first convulsion and the expulsion or extraction of the fetus. This supposition does not take into account, however, the considerable number of cases in which convulsions are not present and in which this phenomenon cannot therefore be regarded as a criterion. The published statistics of the Copenhagen Maternity (*Zeitschrift für Geburtshülfe und Gynäkologie*, vol. lxvii, No. 1) contain the statement that in one series of twenty-nine cases of eclampsia in which delivery was late, 44 per cent. of the mothers and 68 per cent. of the children succumbed. We are not informed, however, whether all of these cases were subjected to appropriate treatment early in the disease, and the result is modified by a statement in the same paper, that the mortality was also considerable in the cases where the women were delivered early. For this reason we cannot accept the results as absolute.

An entirely novel suggestion in the treatment of eclampsia is contained in the advice to employ thyroid extract, particularly in the severe toxemias of the later months of pregnancy, where a normal hypertrophy of the gland does not result, or where there is a diseased thyroid as in exophthalmic goiter. Thus far, the results from this form of treatment have not been entirely satisfactory, probably because the cases have not been properly selected, but sufficient facts are at hand to warrant a further trial of the method and Ward (*Surgery, Gynecology and Obstetrics*, December, 1909) has suggested the hypodermic administration, in preference to that by mouth, where a rapid effect is desired. In cases therefore, where the thyroid is at fault it is difficult to see how a rapid delivery will relieve the toxemia, unless other measures are likewise made use of.

Although veratrum viride has fallen into general disfavor, it has its advocates who can produce statistics which seem to

indicate that the drug influences the number of the convulsions by its effect on the pulse rate. Zinke, of Cincinnati (AMER. JOUR. OBST., vol. lxiii, No. 2, 1911), who is a firm believer in the more conservative methods and especially the use of *veratrum viride*, has recently published a very interesting contribution to the literature of the subject, in which it was shown that cases thus treated react in a most favorable manner.

J. F. Moran, of Washington, at a meeting of the Southern Surgical and Gynecological Society (Dec. 12, 1911), reported a series of 116 cases operated upon by abdominal Cesarean section with a mortality of 49 per cent., and remarks that while statistics of the last decade show an improvement over the previous one, the operative mortality is still far above the general death rate of eclampsia. Moran believes that abdominal and vaginal Cesarean section should not be regarded as a substitute for other methods of intervention but that they have a well-defined field of application in a certain restricted class of cases only.

Bar and Commandeur (*Obstetrique*, Dec, 11, 1911) conclude a review of the last fifteen years research on eclampsia with the statement that treatment can be only symptomatic with the most reliance on prophylaxis. The progress to date has been mainly surgical and that while vaginal Cesarean section in cases with a rigid cervix is probably one of the best means to evacuate the uterus at once, it is a serious operation on account of the complications, which include injury to the bladder and hemorrhage after delivery.

Referring to the title of this paper, I hope that I have called attention to some extent at least to the fact that the divergence of opinion which exists, does not permit us to rely on any one procedure in the treatment of eclampsia, no matter how simple or brilliant it may appear, but that we must employ a method of dealing with these cases which takes into consideration the numerous manifestations of the disease, and which regards a stimulation of the eliminatory functions as the main desideratum. It is a very simple matter to empty the uterus by the Dührssen operation, but if we compare the results with those of less radical means of treatment, are they any better? The main indication for doing a vaginal Cesarean section seems to include that class of cases in which we are dealing with a rigid and elongated cervix, and this is the only class in which the method may be used, provided no dystocia on the part of the child or the maternal

pelvis exists, for, if the cervix shows any tendency to softening, it is generally possible to dilate it gradually by other methods. On the other hand, if it is still elongated, we must not forget that we are usually dealing with a pregnancy not at term and therefore the child's fate is problematical. The writer cannot permit himself to consider as justified the production of a vaginal Cesarean section in a seven or eight months primipara, with the possibility of doing more or less extensive damage to her uterus and soft parts and to be rewarded by the birth of a child that may live three or four days, or at the best a few weeks, and then finally succumbs. It is unfortunate that the operators who have presented large series of cases of vaginal Cesarean section do not favor us with this information as regards the later condition of the child, limiting their statement to the fact that a living child was secured, but usually giving no information whatever as to how long it survived. My own experience in this class of cases with vaginal Cesarean section is not extensive because I tried to limit my operative attacks as much as possible. In the eight personal cases of eclampsia in which the operation was done, it was found easy in execution in the early steps, but less so when the final suturing was done. In one instance it was necessary to postpone the same until a week later, on account of the marked distortion of the cervix which was present. In a number of eclamptics the writer was tempted to empty the uterus rapidly and was usually surprised at the good results which were obtained by a few hours of waiting, during which thorough eliminatory and sedative measures were instituted. While engaged in the preparation of this paper, I have just noted report of three cases of antepartum eclampsia by Ferguson (*AM. JOURN. OBST.*, March, 1912) in all of which treatment was not begun until the onset of the convulsions. In these three cases eliminative treatment alone was employed and although from their description, the cases seemed to demand vaginal Cesarean as an operation of election, it developed that better results were obtained by waiting. My own experience is exactly similar to this.

In view of the contradictory evidence which exists, it would appear, therefore, that the best plan should include a consideration of all methods of treatment rather than a single one, remembering that as the toxin is circulating throughout the body of the mother, the removal of the fetus and placenta alone is insufficient to combat the condition. We must employ means by the aid of

which the toxic substances are eliminated through the natural channels and in the meanwhile we should endeavor to favor the delivery of the fetus by such methods as will cause the least shock and permanent damage to the mother, remembering in this connection the high final fetal mortality, no matter what methods have been employed. It is irrational and it is unsafe to forcibly dilate the cervix which is not prepared for dilatation and this would exclude the improper employment of such instruments as the Bossi dilator, but it does not exclude methods of gradual dilatation, such as the fingers where they can be employed, or the elastic bag, for labor is the natural termination in all cases of eclampsia and if steps are taken to start the same, it is surprising how rapid the response which takes place. The Dührssen operation should be reserved for those cases in which this dilatation cannot be accomplished but where no other obstruction exists, such as a rigid perineum or small vagina and a cervix which is high and cannot be brought down. In these cases, however, the abdominal Cesarean section would seem to afford as favorable chances for the woman and also the child as the vaginal delivery. This, of course, makes the field of application a very narrow one and it should be the aim of all therapeutic measures to be specific, to be employed in cases where they are definitely indicated and not to be employed as a haphazard measure regardless of their final result.

It is quite probable that the ease with which the operation of vaginal section could be done, favored its general adoption in all cases where a rapid emptying of the uterus seemed necessary, and for this reason it was regarded as especially suitable for delivery in eclampsia. It is to be feared, perhaps, that the apparent simplicity of doing the operation led to its execution in cases where these indications were not as carefully restricted as they might have been and conservative measures were sacrificed to speed. As one after the other obstetric operator undertook the procedure, a study of his indications for doing the operation showed in most instances that rapid delivery seemed to have been the only desideratum. It may be well to inquire, however, by studying the literature of the subject from all standpoints, whether any real advance has been secured in the treatment of eclampsia by the general adoption of such rapid methods of delivery. In the first place, before applying this method as the essential one for the treatment of eclampsia, it would appear necessary to distinguish the various classes of cases which are thus submitted to opera-

tion. The production of convulsions seems, however, to have been generally regarded as the determining factor in constructing statistics on the subject and yet in view of their uncertain character, it would be better to eliminate them entirely in this respect. The term "eclampsia" is in itself a misnomer. It refers from its Greek derivation to the sudden onset of the clinical symptom with which we are most familiar and the name of a single symptom has subsequently been given to a disease entity. This, except in a limited sense, is an error and the sooner we can drop the term "eclampsia," the better it would be. The disease of which this is a symptom is a toxemia of pregnancy, pure and simple, the cause, or causes of which, we are by no means fully cognizant of. Although the disease may appear very suddenly, it is really of gradual onset in the majority of cases and the characteristic convulsive seizure is not even present in every instance. This is merely one of the manifestations of the disease and it should not be accepted as the determining factor in our treatment.

A great deal more is known about the etiological factors in the causation of eclampsia to-day than a comparatively short time ago, when it was believed that the kidneys were entirely at fault in the production of the disease. Many worthless theories have since then been propounded, many of which have been disproved in the course of time and thus have helped to make the more reasonable ones more effective. Holland (*Journal of Obstetrics and Gynecology of the British Empire*, Dec., 1909) presents an excellent summary of these various theories, from which he draws certain conclusions as follows:

I. That there is special eclamptic toxin.

II. That chemical discoveries have shown that eclampsia is an autointoxication, in which a profound disturbance of protein metabolism plays an important part.

III. That the general toxic substances are the products of the disintegration of protein.

IV. That in eclampsia, intracellular ferments, especially proteolytic are raised in activity throughout the body, producing autolysis of cells and production of the above toxic substances.

V. That the primary cause of eclampsia is to be sought in the placenta.

The latter assumption is based on the fact that so-called eclamptic manifestations do not result until the placenta is formed, but it has been shown that the various specific placental reactions do not exist, nor do placental extracts possess any special toxicity

for animals beyond causing coagulation of the blood and death from extensive thrombosis. The eclamptic placenta, moreover, does not seem to have any special toxicity. It is claimed, however, that the intracellular ferments of the placenta are increased in activity in eclampsia and that the most probable theory of the cause of this condition is an intoxication of the body by the passage of ferments and autolytic products from the placenta into the circulation.

It may be said that the desire for emptying the uterus rapidly is based on the desire to quickly get rid of the fetus and its placenta, which is assumed to occupy such an important position as an etiological factor, and the statistics which have been collected along these lines are certainly most brilliantly seductive. Yet when we contrast them with those collected by observers impressed with and working along more conservative lines of treatment, the agreement is noteworthy. It is known and must be acknowledged that these toxemias of pregnancy are not all of one kind and those who have applied radical methods of delivery, such as the vaginal Cesarean section, never give us very satisfactory information as to the class of cases subjected to this operation. Their indications are based entirely on the anatomical features present and not on the physiological. A typical case may be cited to further explain this point. A primiparæ some time during the last two months of her pregnancy is suddenly seized with an eclamptic convulsion. Examination shows an elongated cervix present without dilatation. Steps are immediately taken to deliver the patient as rapidly as possible by the easiest means, in this case incision of the cervix and lower uterine segment. A living child is secured which, if premature, usually dies and if at, or near term, may or may not survive for varying periods. The delivery may result in more or less vaginal lacerations and the bladder may be injured, although it must be admitted that in many cases no such complications arise. The patient may cease, but often does not, to have any further convulsions. If she makes a complete recovery, we do not hear anything more of her case; if not, she has been overwhelmed by the toxins,—operation not at fault. Now if we compare an instance of this kind with a similar case where conservative methods are employed, where the elimination through the natural channels is favored and where freedom from convulsive seizures is secured by the administration of sedatives, the final results are found to be equally good, if not better and when the

balance sheet is struck, we find that the patient, although she may have had a few more convulsions is certainly in better condition as regards shock and other complications, than the woman who has been delivered by the more rapid means. Now undoubtedly some of the latter class of cases do not do well, but some of those delivered by vaginal Cesarean also go on and have more convulsions and perhaps end fatally. The children in either case are apt to be so poisoned by the same toxic substances which have poisoned the mother, so that we should not place too much value on their lives.

If we review the results impartially it is quite evident that although vaginal Cesarean section has a place in the treatment of eclampsia, its field of application is a restricted one and it should only be employed where the desired indications are satisfactorily defined. In one of the largest and best known collections of statistics on the subject, the writer states that the uterus should be emptied by vaginal Cesarean section as soon as the diagnosis of eclampsia is established. This teaching should not be accepted without question as it would lead to the performance of the operation without any restrictions as to the variety of the condition under treatment. It has been satisfactorily shown that eclampsia is a more or less self limited disease, and although in most cases there is no question that pregnancy ought to be stopped at once, yet this should only be done with a full knowledge of the necessity for employing proper eliminative and sedative measures before operation. The mere occurrence of a single convulsion, which usually determines the diagnosis and the therapeutic procedure, should not lead to the decision to operate by vaginal Cesarean section, but the individual case should be carefully considered with the idea of first employing the more conservative methods of treatment. If it is necessary to operate, then the abdominal Cesarean section should be equally weighed with that by the vaginal route.

The foregoing remarks are not intended by the writer to be construed as an absolute condemnation of the operation of vaginal Cesarean section. It has been his purpose rather to call attention to the fact that in eclampsia at least, the indications for its performance should be more restricted than they have been in the hands of many operators. The procedure is of undoubted value in a certain well-defined class of cases, but in view of the various forms which these toxemias of pregnancy may take in the late months, no one procedure should be applied for their

relief without taking into consideration that general measures are to be given an equal weight as compared to the local ones.

Although the results with vaginal Cesarean section have apparently been brilliant, it is quite evident that other methods must not be cast aside. Under the influence of the surgical obstetrician, the pendulum seems to have swung too far in favor of those with unmodified operative inclinations and it is now due to go back in the other direction.

23 EAST NINETY-THIRD STREET

IS THE TOXIC VOMITING OF PREGNANCY A CLINICAL ENTITY?

BY

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IN the diagnosis and treatment of the toxemia of pregnancy we have attempted, after a careful examination of the patient, to determine which type of toxemia presents itself. We are generally able to recognize the following types: 1. Toxic vomiting; 2. toxemia with kidney complications; 3. acute yellow atrophy of the liver; 4. toxemia, with pre-eclamptic syndrome; 5. eclampsia.

In the treatment of the vomiting of pregnancy we call those cases toxic which resist the hundred and one measures and drugs recommended, arrive at our diagnosis by a process of exclusion and refuse to admit that we are dealing with either the reflex or neurotic type of vomiting. Our diagnosis is aided by the discovery that there exists a disproportion between the urea nitrogen and the ammonia nitrogen in the urine. Indeed, we are now taught that with a disturbed ratio of the nitrogen compounds existing in the presence of persistent vomiting, the immediate interruption of the pregnancy is the only procedure, provided we wish to save the life of the mother. It will be the purpose of this paper to show that the accepted classification of the types of vomiting of pregnancy, viz., reflex, neurotic, and toxic, is an erroneous one, and an entirely artificial one from the clinical findings. In the following reported cases, it is the writer's intention to show that the only abnormal symptom present is vomiting, and that the degree of emaciation, anemia and prostration are directly proportionate to the period of

pregnancy. The determination of the ratio of the nitrogen compounds in the following cases was not made:

CASE I.—Mrs. R., age, twenty-seven; primipara; pregnant seven months. Except for nausea and vomiting, which has persisted since conception, patient has had no other complication. Vomiting has resisted the usual drugs recommended. Patient very anemic; hemoglobin 50 per cent. (Tallquist). Urine: total amount in twenty-four hours 450 c.c., specific gravity 1026; color, high; indican reaction, heavy; microscopically leucin crystals and tyrosin needles present.

CASE II.—Mrs. T., age twenty-four; primipara; pregnant six months. Has vomited ever since she missed her last period, first bright green tinged mucus, later yellow, and for the last month alternating between yellow and a dark brown thin fluid. Patient says she has kept nothing in her stomach for the entire six months. Suffers from palpitation, restlessness and toward the end of the day a slight temporal headache. Her urine is negative with the exception that it is concentrated and shows a heavy deposit of urates.

CASE III.—Mrs. J., primipara, age eighteen; duration of pregnancy, six months. Has vomited since the second month, morning, noon and night; bicarbonate of soda in hot water substitutes heart burn for vomiting; retains a little soft-boiled egg and toast toward evening; patient naturally thin, says that she is considerably emaciated, and suffers from nervousness, palpitation and dizziness. Has a slight headache upon exertion. Urine: twenty-four-hour quantity, 650 c.c., specific gravity, 1024; highly colored, otherwise negative; hemoglobin (Tallquist) 55 per cent.

From a urinary analysis of seven other selected cases, all of whom were less than three months pregnant, and all of whom had vomited more or less from the start, no important urinary findings were present and clinically no symptoms of any moment were complained of. I have purposely omitted other cases in which positive urinary findings, coupled with positive clinical symptoms of an eclamptic or a pre-clamptic character, were present. In seven other cases, all of whom were multipara, from one to three months pregnant, and nauseated from the date of conception, and in whom no attempt at treating local conditions such as retrodisplacements, or eroded cervixes was made, and in whom no pathological urinary findings were discovered, the treatment to be outlined was used.

In the treatment of the vomiting of pregnancy a brief résumé of the drugs and measures recommended is as follows: Bismuth, cerium-oxalate, iodine, phenol, and a strong cup of hot coffee in bed. The breakfast in bed, or, if local conditions of the cervix uteri are found, stretching, topical applications of silver

nitrate, phenol, or phenol and iodine, constitute a portion of the list. In some cases the above mentioned agents will be successful, in others not. Laphorne Smith states that he has never seen a case of the vomiting of pregnancy that could not be cured by bicarbonate of soda and hot water. In the writer's experience this will not suffice. Taking any case at random, ignoring the period of pregnancy, the length of time the patient has been vomiting, and retroversions or eroded cervixes, we have in gastric lavage a procedure which will arrest vomiting. In the above mentioned cases, gastric lavage has entirely controlled the nausea and vomiting. It was first used morning and night and later on, in the morning only, salt solution, plain water, or water and bicarbonate of soda, a teaspoonful to a quart, being employed for the purpose. Austin Flint, in his discussion of the management of the pregnant patient, refers to two cases which were *in extremis* from persistent vomiting but which were both relieved of their nausea by gastric lavage prior to taking the anesthetic for the interruption of their pregnancy. I wish it to be understood that the vomiting of pregnancy is oft times a forerunner of trouble, but that we have a toxic type of vomiting as a clinical entity I wish to dispute. In persistent vomiting as cited in the above cases, the urinary and clinical symptoms are characteristic of the findings in any one long deprived of food and water. Given the syndrome of constipation, disturbed vision, positive urinary findings, arterial hypertension, headache, edema and changes in the optic fundus, an immediate interruption regardless of the period of pregnancy is the only resort.

Conclusions.—Toxic vomiting of pregnancy, as a clinical entity, does not exist. Long continued vomiting, without proper treatment, will give the urinary findings of one long deprived of food and water. Gastric lavage absolutely controls the vomiting of pregnancy. The induction of an abortion for the cure of the vomiting of pregnancy is not justifiable unless the pre-eclamptic syndrome presents itself also.

A STUDY OF THE INTEGRITY OF THE UTERINE SCAR AFTER CESAREAN SECTION.*

BY

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Delivery by Cesarean section has become in recent years a not infrequent operation. From all parts of the country we may read reports of longer or shorter series of cases. And, when we consider the welfare of both mother and child, the results in the presence of pelvic deformity are visibly better than with any other method of procedure. It requires, however, a nicety of judgment and a reserved enthusiasm in dubious cases to distinguish clearly the choice between abdominal and vaginal birth. Although the dramatic glamour of former years still clings to its execution, the extraction of the child from the mother's womb through an abdominal incision is not a difficult feat. With the employment of modern surgical technic, as in all other abdominal work, it has largely lost its septic and hemorrhagic terrors.

Nevertheless, we cannot afford to disregard the other surgical problems involved. A heavy muscle not supported or reinforced by fascial covering is cut through; a muscle which may be called upon later to functionate vigorously. Besides the risks attending the section of any intraperitoneal organ lined with mucous membrane, there is the added danger of rupture through or adjacent to the cicatrix in future pregnancies.

As the indications broaden for the operation of Cesarean section, more and more do we include the lesser degrees of pelvic contraction; and in rare instances we may feel justified in performing abdominal hysterotomy upon cases of eclampsia and placenta previa where the soft parts are tight and rigid. Although in such conditions the immediate pelvic results are ideal, we are occasionally forced to remember that, after all, a woman once "Cesareanized" has a uterine scar of unknown strength. The fact that she was brought safely through her accouchement is not all. What of her future pregnancies?

The question did not formerly obtain when the operation was

* Read at a meeting of the Section on Obstetrics and Gynecology, N. Y. Academy of Medicine, February 23, 1912.

done solely for absolute contraction of the bony pelvis. We all knew that these women must again be subjected to Cesarean section in their later deliveries unless they had been previously sterilized by resection of the tubes. But now a class of cases is gradually assembling who might be perfectly capable in succeeding labors, in so far as the bony obstruction is concerned, of having their babies by the vaginal route, or who could push a smaller child through a moderately contracted pelvis without damage or great effort. Occasionally, however, under the stress of labor such a uterus will rupture at the location of the old scar.

In 1908, Brodhead(1) had collected nineteen cases of rupture from the literature, adding one of his own. Following this paper Mauclaire and Burnier(2) summarized twenty-two cases, fifteen of them being repetitions of Brodhead's collection and seven of them being new cases. A rupture after two Cesareans was reported by Cameron(3) in 1910, and one by A. G. Collins(4) in 1911. Cameron also reported a case in the same communication, similar to several in the series about to be described, of impending rupture, where on opening the abdomen at the second Cesarean a thin window of peritoneum at the uterine scar was the only structure separating the abdominal cavity from the interior of the uterus.

In the majority of these published cases there is no detailed description made of the ruptured muscle microscopically and it is not clearly defined whether the scar itself gave way or the adjacent muscle tissue. Mauclaire and Burnier note that in most of the microscopic reports there is agreement as to occasional imperfect healing of the wound, but that none give evidence of a true invasion of the scar by decidual cells similar at all to the true erosion that takes place in a ruptured ectopic pregnancy.

A suggestive experimental study was made in 1910 by Mason and Williams(5) of Boston on the strength of scars in the uteri of pregnant guinea-pigs. They excised areas of muscle wall of the uterus, containing the old scar and stretched the tissue to the point of tearing. On examination of the laceration thus produced they proved to their satisfaction that the tissue gave way not at the scar but through normal muscle fibers. The animals used were so small as to make microscopic description of the scar itself of no value.

It has impressed the writer that further valuable information may be derived from a study of the uterine scars of former Cesareans in human females. This has been attempted by

selecting from the case histories of the Lying-In Hospital and from personal experience in the operation of Cesarean section;

I. Instances of abdominal Cesarean section followed by vaginal delivery, of which there are three cases,

II. Descriptions of the gross appearance of the intact scar in repeated Cesareans,

III. Instances of marked attenuation of the scar of which there are four cases described at a later Cesarean,

IV. Instances of rupture of the uterus after one or more Cesarean sections, of which there are four cases, and finally,

V. By making microscopic examination of the margins of the rupture in the uterine muscle and of sections through the old unruptured scar.

Considering first the cases of Cesarean section followed by vaginal delivery:

CASE I.—(C. N. 3093.) Mrs. Mollie A., age thirty-three years, iii-para, with a history of several still-births by instrumental delivery and anxious for a living child. Her pelvis was of the funnel type, moderately flattened at the brim and with a narrow outlet. The head refusing to engage, a 4100 gram baby was successfully delivered by Cesarean section on Sept. 22, 1903. The uterine wound was sutured with chromicized catgut in layers, and her convalescence was smooth. Two and a half years later, on March 26, 1906 (C. N. 7280) after two hours of moderate pains she was spontaneously delivered per vaginam of a 3600 gram baby with smaller head measurements than the previous one.

CASE II.—(C. N. 12071.) The same woman, Mrs. Mollie A., presented herself pregnant at term on March 9, 1908. She was again delivered with ease under the care of the house surgeon of a 3450 gram child. There was no hemorrhage or laceration, and both patients were discharged in good condition on the eighth day.

CASE III.—(C. N. 10525.) Mrs. Annie S., age twenty-five, ii-para, was admitted Aug. 9, 1907. Her first baby had been born alive in Germany with the use of forceps. The membranes were ruptured and dilatation of the os was complete. Her temperature on admission was 101° and her pulse 120. The child presented by the vertex in the L. O. A. position. She was delivered by Cesarean section of a 3700 gram baby, the indication for the operation not being stated in the history. Her convalescence was complicated by a more or less severe toxemia from uterine infection, for which intrauterine douches were employed on the eighth and eleventh days. She left the hospital on the nineteenth day.

In September, 1909, two years later, this patient was admitted to the writer's service. Her last menses had occurred November 23, 1908, so that she had expected her confinement in August.

On admission September 11, she had been in active labor for about eight hours. The cervix was dilated to the diameter of three finger tips and the head lay above the brim in transverse position with the occiput to the right. The interspinous measurement was 23 cm. and the intercrystal 28 cm. The external conjugate was 17.5 cm. and the internal true conjugate measured 8.5 cm. It was evidently a simple flat pelvis. With pressure above by the Kerr-Mueller method the head could be made to engage in the brim and it was decided to attempt vaginal delivery by forceps. A high application of the axis-traction instrument followed by anterior rotation with the small solid blades accomplished a fairly easy extraction of a 3500 gram child. The writer felt at the time that the woman might have delivered herself spontaneously, but considered it unwise to risk further tension on the old uterine scar in view of the history of possible sloughing and consequent thinning of the cicatrix, together with the use of the intrauterine douche. The woman left the hospital with her baby on the tenth day.

There were forty-two cases in which at a subsequent Cesarean the scar was either not discernible or was described as solid with no apparent thinning or stretching. Most of these have already been reported by McPherson (6). In the four instances in which the writer has had occasion to perform repeated Cesarean section, the scar in the uterus has been represented merely by a slightly depressed linear whitening of the visceral peritoneum.

In sixteen out of the forty-two cases in the hospital records of the multiple operation there were adhesions of the omentum, either to the uterus or to the anterior abdominal wall—in some cases exceedingly dense. These adhesions did not seem in any way to affect the strength of the uterine cicatrix. It is noteworthy here that adhesions once formed, when tied off and cut, always recur and in denser fashion, at later Cesarean sections, thus rendering the operation more difficult and tedious. Six times the placenta was found attached over the region of the old incision without impairing its solidity. Seven times the incision in the original operation had opened into the placental attachment. Suture of the placental site in all these resulted in a sound scar as proved at the second operation.

The instances of marked attenuation of the scar are most interesting and instructive. In two of them the placenta was found directly under the old wound, in one of which the scar was described as soft, irregular and translucent, almost transparent. In the other two the placenta was not in relation with the old incision. The thinning in these had evidently depended entirely

upon improper healing of the uterine wound. Their convalescence had been febrile and intrauterine douches had been used in both. We all know how prone the uterine tissue is to slough in vaginal Cesarean in the presence of any infection. There is no doubt the same process occurs when the wound is higher up and entirely within the uterine cavity. In one of the author's cases operated upon in 1905, four knotted chromicized gut sutures united by a shred of necrotic uterine tissue came away with a vaginal douche on the fifteenth day. If she ever becomes pregnant again we will anticipate a greatly weakened scar and avoid labor by elective section.

One of these thinned scars produced by sloughing of the uterine wound was excised at a later Cesarean. Sections through it show it to consist at its weakened portion merely of the peritoneal coat and subperitoneal cellular tissue. The muscle tissue of both margins of the wound did not unite primarily but healed by granulation. The remainder of the muscle tissue in the specimen is normal. There is a history of stormy convalescence following the original operation with retention of lochia for which intrauterine douches were given on the ninth and thirteenth days postpartum. Evidently there was infection and gaping of the inner layers of the wound. The placenta lay posteriorly and not in relation with the thinned scar.

There are four cases to report of actual rupture of the uterus in or adjacent to the old scar that occurred in subsequent pregnancies. One of them has already been reported by Brodhead, through the courtesy of Lobenstine, in whose service at the Lying-In Hospital it occurred. It is interesting to review it in order to report the later pathologic findings in the uterus.

CASE I.—(C. N. 4483) Mrs. Bertha G. (R. C. James). Delivered by Cesarean section. Adherent membranes. Excessive hemorrhage. Uterus packed. Patient had been in labor thirty-six hours with strong pains. Os three fingers dilated. Mild temperature, 100 to 101 for four days. Baby weighed 3300 grams and lived.

(C. N. 7664.) Mrs. Bertha G. Eighteen months later (R. W. Lobenstine), second Cesarean done. There was no trace of the old scar. Baby weighed 3850 grams and lived.

(C. N. 11372.) Mrs. Bertha G. On Dec. 11, 1907, this patient was again admitted to the service of Dr. R. W. Lobenstine, in a condition of extreme shock, and with a very imperfect history of her labor. Uterus had probably ruptured eighteen hours before admission, after labor pains had been occurring for only about five hours. The abdomen was moderately dis-

tended. The fetus could be plainly felt through the abdominal wall. The entire abdomen was exquisitely tender. By vaginal palpation the cervix was soft, about 2.5 cm. long and admitted one plus fingers. Her pulse was barely perceptible. The patient looked as if she would die at any moment.

At operation, child and placenta were found free in the peritoneal cavity. The uterus lay in the posterior part of the abdomen, and was opened up vertically from internal os to fundus along its anterior aspect. The rupture was through one of the old Cesarean wounds, and was so extensive that the uterus was flattened out. A supravaginal hysterectomy was then done.

The first eight days of convalescence were rather uneventful. On the eighth day the pulse and temperature were elevated. Pneumonia developed in the right chest posteriorly and the woman died.

Postmortem examination through the laparotomy wound found the pelvis and abdominal viscera apparently normal. No pus. No subdiaphragmatic abscess.

The baby weighed 3300 grams. Still-born.

Report No. 2074, Dec. 11, 1907, from the Hospital laboratory on section from margin of rent in uterus, "showed a uterus with rupture in anterior wall extending from fundus to cervix. Section through tissue at margin of rupture shows cloudy swelling of the muscle, an exudate in places between the muscle fibers composed of leukocytes and serum. Congestion of the blood-vessels and thrombi on the inner surface of the uterus. There is no excess of fibrous tissue present in the section." In other words, there was no evidence of scar tissue. From the microscopic appearance, it cannot be said whether the rupture occurred directly in the old scar or closely adjacent to it, as the rent goes through apparently normal muscle tissue.

CASE II.—(C. N. 6885.) Mrs. Becky A. Age, twenty-three, i-Para. Reported from the service of Dr. A. B. Davis. High forceps. Baby weighed 2600 grams, and died two months later.

(C. N. 8918.) Mrs. Becky A. Dec. 23, 1907. Transferred from O. P. D. for Cesarean delivery. Membranes intact. Cervix fully dilated. Bloody urine. Bleeding from cervix. No placenta made out by vaginal examination.

At operation the placenta was directly under the uterine incision. The convalescence was protracted. The temperature the second day was 103. Pulse 140. Temperature was high till the sixth day. Intrauterine douches were employed in the treatment of her condition. On the twenty-sixth day postpartum there was still profuse purulent discharge from the uterus. Cystitis and tardy involution complicated convalescence. Gonococci were found in the baby's eyes on the twelfth day. It weighed 3000 grams and survived.

(C. N. 11607.) Mrs. Becky A. Jan. 9, 1908. Age, twenty-five, iii-Para, was admitted to the hospital. Labor began at 1 A. M., June 9. She was operated at 3 P. M. the same day, the pains

being mild, the cervix two fingers dilated and the membranes intact.

Operation.—The abdominal scar was of a keloid type from the former Cesarean. There were omental adhesions to the anterior abdominal wall and to the uterus on the right of the median line above and below the umbilicus. The intestines protruding were packed back with gauze pads. Because of the low position of the uterus and the adhesions it was necessary to enlarge the abdominal opening 12 cm. downward and to the left of the umbilicus. At this stage old black tenacious clots were found between the left broad ligament and the abdominal wall and were removed. A partial rupture of the uterus was discovered at the lower end of the old uterine cicatrix, which had thinned out and spread until it was 2 cm. wide. Five cm. above the bladder reflection of the peritoneum in the median line and in the old cicatrix was a rent 3 cm. long through which intact membranes the size of an English walnut protruded. This was probably the source of the old bleeding and there was no fresh hemorrhage. The uterus was opened with scissors and by tearing (as the patient was believed to be dying and was taking the anesthetic badly) and the child delivered. There was little active bleeding and only some slight oozing of black blood. The lower end of the uterine wound looked as though the sutures had given away long ago in the first repair and the uterine peritoneal surface healed over. These surfaces were freshened before introducing the sutures and the tubes were excised to prevent further conception. The convalescence was fairly smooth. The baby weighed 2150 grams and lived and both patients left the hospital on the twentieth day.

CASE III.—(C. N. 12583.) Mrs. Sarah M. May 15, 1908. Reported from the service of Dr. A. B. Davis. vii-Para; age thirty-three. One living child with instruments. Two spontaneous deliveries, children living. Three still-births with instrumental delivery. Flattened pelvis. Face presentation, R. M. P. In labor for twenty-four hours before admission. Membranes ruptured. Cervix two fingers dilated. Delivered by Cesarean section (Dr. A. B. Davis). Baby weighed 3500 grams and lived. Temperature 102 on second day. Pulse 120. Pulse and temperature normal after fourth day. Discharged fifteenth day postpartum.

(C. N. 17780.) Mrs. Sarah M. June 1, 1910. Age thirty-five, viii-para. Second Cesarean section. Prolonged labor. Floating head. Patient admitted in labor about 9 P. M. having contractions about every fifteen minutes. Stated that she had had pains all day, with pain in lower abdomen for two weeks. On May 31, the pain was so severe that this hospital sent its ambulance for her about noon. She refused at that time to come in. Upon admission, cervix was less than two fingers dilated. Membranes intact and protruding and head wholly above brim. Could not be engaged by suprapubic pressure.

Fetal heart was not heard. Patient's abdomen was markedly distended and she complained of extreme tenderness upon pressure over the fundus. Face was flushed, lips dry and brown. Pulse ranged from 100 to 110 and of good quality. Temperature 100.8. No douche and one vaginal examination.

Operation.—Abdomen opened through old cicatrix. Upon entering the abdominal cavity, clots in a thin layer were found, over the upper anterior surface of the uterus but there was no fresh bleeding. There were no adhesions of any kind. Uterus filled abdomen tightly full. On examination a rupture about 4 cm. long was found in the lower portion of the old Cesarean scar, and through this opening placental tissue protruded about 1 cm. above the surface of the uterus. Upon inserting two fingers into this opening, and in attempting to lift the uterus up, the cicatrix in the uterine wall readily separated throughout its entire length. The placenta was directly under the opening. After removal of the child, the uterus contracted well and tended to slip away into the lower abdomen. There was considerable hemorrhage. The uterine wall was very thick. The edges of the uterine wound were freely freshened with scissors and some "cicatricial" (?) tissue cut away. (Unfortunately no microscopic examination was made of these clippings.) The uterine tear was limited to the old uterine wound. The uterus was then closed in the usual way.

Patient upon leaving the hospital had the uterus adherent just below the umbilicus to the anterior abdominal wall. Uterus as a whole had involuted well and the woman underwent a fairly smooth convalescence. The baby lived, weighing 3530 at birth.

CASE IV.—(C. N. 6156.) Mrs. Martha C., ii-para, age thirty-one. First confinement (1903) was instrumental and the child was still-born. A number of years ago the patient was operated upon in Germany for osteomyelitis of both tibiae and has scars the length of both legs anteriorly. She walks since with a limp. The right leg is 2 cm. longer than the left. At the antepartum examination four months ago, the extent of the pelvic deformity was not discovered. When this patient was first seen, Aug. 25, 1905, she had been in labor for several hours with the head above the brim in the R. M. P. position. The pelvis was found to be of a generally contracted type with a working conjugate of not more than 8 cm. Membranes ruptured and cervix was fully dilated four hours previously, with an arm prolapsed. A version was considered but the uterus was too tightly contracted about the child to introduce the hand with safety and turn the infant. A high application of the axis-traction forceps was made but it was impossible to engage the head with fair traction. During these maneuvers the cord prolapsed in a long loop. It was replaced manually and the cervix and vagina lightly tamponed with gauze. The patient was sent to the hospital and a Cesarean section performed by the writer. The second assistant's hand was thrust into the vagina at the beginning of the

abdominal incision and was of great value at the time of extraction of the child in pushing the head up through the tightly contracted Bandl's ring that gripped the infant between head and shoulders. The incision in the uterus went directly into the placental site. The child weighed 3400 grams and lived. The mother had a stormy convalescence with considerable abdominal distention and tenderness over the uterus during the first week, and with a temperature of 100° to 101° for three weeks, finally leaving the hospital on the thirty-eighth day with her baby, which weighed 4200 grams, healthy and breast-fed.

Examination on discharge showed an abdominal wound about 3.5 inches in length with tendency to keloid hypertrophy. The uterine fundus was 7 cm. above the symphysis and evidently adherent to the anterior wall as it was extremely difficult to reach the cervix vaginally. Two successive Cesarean deliveries were done by Dr. R. W. Lobenstine, as follows:

(C. N. 11199.) Mrs. Martha C. Nov. 15, 1907. Membranes intact. Operation early in labor. Scar not noted, but can be seen in specimen after third Cesarean. Convalescence smooth, except for pain over right iliac region where she had had a severe cellulitis at the time of her first operation. Baby weighed 3750 grams and lived.

(C. N. 14129.) Mrs. Martha C. Dec. 3, 1908. Omentum found widely adherent to anterior abdominal wall. Considerable hemorrhage. No description noted of former uterine scars. It was deemed inadvisable to sterilize the patient at this time. (Unfortunately, as it afterward proved.) Convalescence stormy until tenth day. Temperature 100 to 101° . Abdominal wound broke down.

This woman was next seen in January, 1911. She was then pregnant for the fifth time and from her data and the size of the child it was estimated that she would be at term about March 8. Nothing more was heard of her and as she did not appear in March it was believed that she had been delivered at some other institution. However, on April 6, at approximately the end of the eleventh lunar month in her pregnancy she was brought to the hospital by her husband (C. N. 19409) in a condition of shock, markedly pale, cold, sweating and having severe abdominal pain. From what history we could obtain she had had a few uterine contractions for an hour and had then suffered sudden excruciating pain in the abdomen. In this agony she had come to the hospital in the street car, having to be carried from the car by the hospital office attendants.

On the writer's arrival at the hospital, no fetal heart could be heard. The patient was pale and cyanosed, and with an imperceptible pulse. She was continually moaning and begging for relief from her intense continuous abdominal pain. The abdomen was tense and greatly distended and everywhere was very sensitive to touch.

Operation.—(One hour after admission.) The abdomen was

painted with pure tincture of iodine and the patient rapidly draped with sterile sheets on the table where she lay. A minimum amount of ether was used. At the same time as the abdominal incision was made an intravenous infusion of normal saline was begun. The abdomen was opened from umbilicus to pubes. It was full of dark blood and clots. The fetus and placenta were loose in the abdominal cavity. The uterus lay flattened against the posterior abdominal wall, rent from top to bottom along its anterior surface. There was no fresh hemorrhage. The fetus and placenta were removed and a rapid hysterectomy

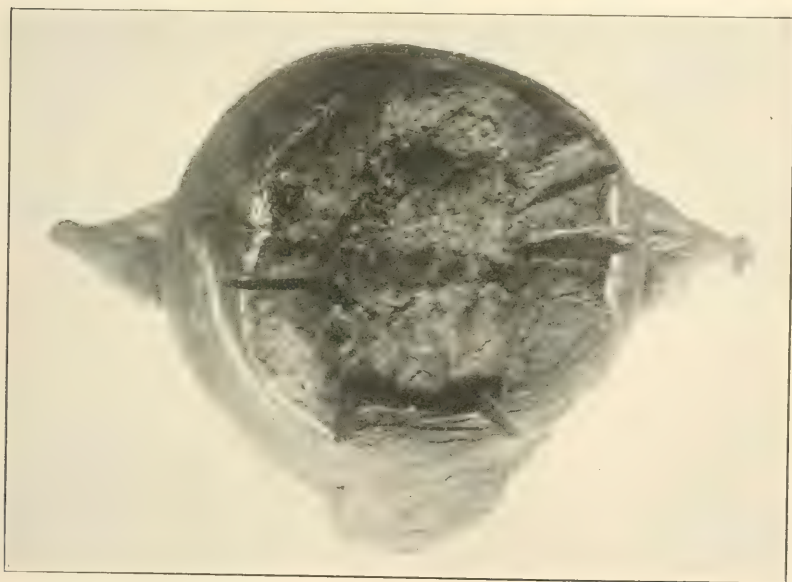


FIG. 1.—Case IV. Anterior surface of uterus ruptured between Cesarean scars

performed with clamp and ligature. Blood clots were removed and the patient being in such desperate condition no attempt was made to close over the cervical stump. The pelvis was packed in its lower portion with iodoform gauze pushed into the vagina from above and the abdominal wound quickly closed with through and through sutures. Shock treatment was instituted and active efforts at resuscitation employed but the patient expired thirty minutes after the completion of the operation. The fetus weighed 4500 grams and the dimensions of the head as well as the firmness of the cranial bones showed it to be considerably over-time.

From an examination of the uterus it would be inferred that the laceration did not take place in one of the old scars, but between two of them. The margins are fully as thick as the

remainder of the uterine wall. Along each side of the rent the white line of an old incision is readily discernible on the peritoneal surface. At some distance to the right of the tear is the other of the three scars.

It is to be supposed that two parallel scars less than a centimeter apart isolate between them an intermediate danger zone of tissue that has on both its trophic nerve supply and its blood supply intersected, and is therefore intrinsically weaker than the muscle tissue distal to these incisions. This situation might be avoided either by making the second incision at a considerable distance from the first one, or else by always excising the old scar at a subsequent Cesarean section. It is not advisable to go immediately through the former cicatrix for a much larger opening would be necessary as the inelastic margins of such a wound do not stretch sufficiently to accommodate the after-coming head and ragged tears may result at either end. Such tears are uncontrollable in extent and difficult to suture satisfactorily.

Sections for study were made from five points along the margins of the rupture. These sections included the site of the former incisions as marked by the overlying peritoneal scar on either side of the rent and well into the adjacent muscle tissue. Microscopic examination shows the serous coat of the uterus to be thickened at the location of the previous scars. Along the ruptured edge there is normal muscle tissue infiltrated with red and white blood cells and serum which has separated the fibers to a certain extent. Evidently the rupture occurred through normal uterine tissue. There is no indication of the presence of scar tissue in the muscle of any of the five sections examined. At points where the section of tissue goes through the third solid scar as marked by the depressed thickening of the peritoneal surface, intact muscle fibers can be seen crossing the apparent old line of incision. As far as can be observed under the microscope an apparent regeneration of the severed muscle fibers has taken place.

It has been demonstrated that the muscle fibres of the uterus are arranged in whirls and run in many different directions. Some advantage is taken of this fact in opening the uterus as we usually tear through the inner thickness of the incision with the fingers instead of completing it with the knife. Thus there is reason to believe that many of the uterine muscle fibres are not severed in their continuity but are split apart somewhat

after the nature of the ordinary intramuscular abdominal incision, though in a more minute fashion.

It is impossible as far as our investigations have gone, to discover any scar tissue in a well-united uterine wound that has healed by primary intention.

In accordance with the gross and microscopic findings we might explain this rupture after three Cesareans as occurring with the onset of labor in a uterus already distended by an over-time child; the rent taking place in the narrow segment of apparently normal muscle tissue isolated between two closely approximated parallel scars, this strip of tissue being intrinsically weaker on account of previous section of its blood and nerve supply.

Much has been written as to the proper method of suture of the uterine wound. It is sufficient to note that any method of suturing is suitable, providing the stitches are placed closely enough and deeply enough. To our mind it is less dangerous to occasionally go through the mucous membrane, rather than in avoiding it, to place the stitch so superficially as to allow the inner surface of the wound to gape.

We may profit in our future operating from a brief consideration of the teachings to be derived from these few illustrative cases. The repeated section is usually a no more difficult proposition than an original section. Among the histories at the hospital are records of women upon whom three, four and even five successful Cesarean sections have been consecutively performed. Out of fifty instances of the multiple operation, the old scar was either not found at all or when noted was solid in forty-two. Four times it was attenuated in form, twice there was partial rupture at the location of the old scar and twice complete rupture of the uterus. Therefore it is suggested:

First.—In undertaking a Cesarean section upon a woman who has been long in labor, with ruptured membranes, and who may be infected, in addition to the immediate dangers of septic morbidity and mortality, we must recognize the probability of obtaining a poorly healed scar that will be a bad risk in future pregnancies.

Second.—When performing repeated Cesarean section it would be best to excise the old uterine scar, rather than make a new incision parallel to it and avoid the isolation of a weakened strip of uterine wall between two scars.

Third.—Intrauterine douches are to be avoided in the treat-

ment of retained lochia after Cesarean section, not only for their immediate dangers, but also on account of the risk of mechanical injury to the uterine wound.

Fourth.—In the management of a parturient woman who has been previously "Cesareanized" for the relative indications, such as moderate pelvic contraction or excessive size of fetus, or certain types of eclampsia and placenta previa, we must be guided by the history of the previous convalescence as well as by the method of suturing employed. Only thus can we be assured of the integrity of the old scar and to what extent it will stand the stress of labor and of vaginal delivery.

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- 29 EAST SEVENTY-SEVENTH STREET.

LOUISE BOURGEOIS. AN OLD MIDWIFE'S TALE.

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(With illustrations.)

I

SINCE that day when the midwife bound the red cord around the wrist of the first of Tamar's twins and the youngster's brother—still *in utero*—unfairly drew him back and took his first place away from him, the midwife has represented the human side of obstetrics. Whether in natural sympathy, in social and moral interest, as a raconteur or as an historian, in dexterity and kindly common sense and shrewd worldliness, her position is a normal one and, up to the limits of her education, she has filled it in the past with dignity and distinction. Unless we recollect the basic fact that her male competitor has, unfairly, absorbed to himself during the past centuries all else of scientific education and all the position and profit resulting therefrom, it is difficult to understand how he has finally managed so successfully to supplant her also at a ceremony where she is a far more dignified, appropriate, and harmonious figure.

Were we to trace the history of the gradual usurpation of this peculiarly feminine function by a sex which, whatever its intellectual superiority may be, is without any doubt inferior in natural instinct and manual dexterity, it would probably disclose an astonishing, although unconscious parallelism with male usurpations elsewhere.



FIG. 1.—Louise Bourgeois. From Delacoux' *Sages-femmes Celebres*.

For the present, and under modern conditions of society and culture, the midwife as a factor in the history of great events is hardly to be reckoned with. Numerically, she may be as strong as ever, but her clientèle can scarcely be said to represent the haute monde or the history makers of the present generation. And yet, such was not always the case—even within the memory

of those now living. Not to multiply instances, it is sufficient to recollect that two years after Princess Charlotte and her child* died (1817) under the care of Baillie and Sir Richard Croft, a German midwife, especially imported into England for the occasion, brought the future Queen Victoria† successfully into the world. In 1811 Madame LaChapelle shared with Dubois the distinguished honor of confining Maria Louisa at the birth of the Duc de Reichstadt. Mrs. Stevens, in 1762, attended the wife of George III at the birth of George IV, and also at her subsequent confinements, although John Hunter was held in reserve in the next room.

But if we would know the midwife in her prime, and when high-borne ladies counted it but shame even to admit a man within calling distance of their lying-in chamber, we must go back quite 300 years to the days of Henri IV and the beautiful Gabrielle d'Estrees and the fruitful Marie de Medici. This was two generations before Louis XIV, grandson of Henry IV, smuggled in Julian Clement‡ to attend the confinement of Mdle. de la Valliere (1663), and so set the bizarre fashion for the French court to employ men midwives—at least for their mistresses.§

In 1600, at the court of Henry IV and Marie de Medici, the choice of obstetricians, even when it became the concern of queens, was merely between midwives, for the notion of a male accoucheur, except as a consultant, was hardly to be taken

* The princess wanted a midwife, but Dr. Baillie insisted on Croft. Had the child lived it would have ruled England. Mortification over the tragic outcome caused Croft to kill himself. See Playfair, *Obstetrics*, 1880.

† She was the daughter of the Duke of Kent and of Princess Victoria of Saxe Cobourg Gotha. The midwife had confined the princess' German mother.

‡ Clement is incorrectly reported to have been the first man in France to attend normal labor. Of course, he was not, for Guillemeau antedated him by more than fifty years. And yet the temper of the times is shown by the fact that in 1522 a certain Dr. Wirtt was burned alive at Hamburg for assisting at a confinement disguised as a midwife. Even La Valliere—of shady morals and damaged reputation—is said to have kept her head covered with a hood during the presence of Clement in her room.

§ "Un despote, un tyran, petit-fils d'Henri quatre,
Qui triompha sans gloire et vainquit sans combattre.
Qui sans talens, des art devint le protecteur
Qui de sang de son peuple abreuva tout flatteur,
Qui de l'Europe enfin prepara la ruine
Le premier en Europe a fait rougir Lucine.
Et changeant en vertu son impudique ardeur,
Au rang des préjugés a placé la pudeur."

Lacombe, *Luciniade*; a poem sparkling with wicked wit and license. As may be imagined, all of the sage-femmes of the day learned by heart, and frequently quoted, this particularly offensive passage.

The line in italics was based on Astruc's misstatement that Clement was the first man in France to confine women. Probably Astruc merely referred to the women of the court.

seriously by any woman making claim to respectability. The queen herself referred sneeringly to Guilleméau as "*Cet homme de Paris qui accouche les femmes.*"

Now it so happened that the king, in spite of the sterility of his first wife, Margaret of Valois, had already passed through numerous obstetrical experiences, chiefly at the bedside of la belle Gabrielle. The little Duc de Vendosme, who figures in the subsequent narrative, was the king's child by Gabrielle d'Estrees, and the latter had died in child-bed but the year before (1599), of puerperal convulsions.* The king, therefore, already had ideas of his own about midwives and proceeded to engage la dame Dupuis, sage-femme jurée of the city of Paris, for the function. This woman had confined the king's sister, the Duchess de Bar, but was still better known to him from the fact that she was the very midwife who had delivered his three children by Gabrielle.

Lax as were contemporary morals, and especially those of royalty, it may well be imagined that while Dupuis may have been professionally all that was wanted, she could hardly deodorize herself to a point where the fine nose of the Italian queen would fail to detect about the sage-femme at least a suggestion of the subtle perfume of that beloved French mistress who was but just dead. Besides this most cogent reason, probably kept well in the background, the queen's maids of honor took pains to assure her majesty that, by personal experience, they knew Dupuis to be a superannuated old shrew. Naturally, the wife rebelled, at first secretly, then openly, and took council with her own physician, de Laurens, as to a midwife quite as safe and less redolent of the king's most notorious amour. De Laurens was a shrewd courtier and bowed to the inevitable, for in her fresh imperious will the queen was recognized as more than a match for the amorous but jaded Henry. In addition, she had a villainous temper which the king even thus early in their conjugal life had learned to fear. De Laurens arranged a meeting at the Hostel de Gondy, not far from Paris, between the queen and a certain Louise Bourgeois who had successfully confined many of the ladies of the court. It took the queen "but the space of a pater noster" to form a favorable opinion of the new midwife, and she returned to Paris with her royal mind made up.

* One of the physicians (d'Alibou) who enjoyed the doubtful honor of acting as consultant in this case committed suicide shortly thereafter, thus antedating Sir Richard Croft by more than 200 years.

One shake of her head and one stamp of her foot brought the wearer of the helmet of Navarre to a proper sense of his conjugal duty, la dame Dupuis went snarling* into the discard, and the midwife question was settled in that royal family for all subsequent confinements.

Six children were borne to Henry and Marie within nine years; a dauphin, the future Louis XIII; madame Elizabeth, future queen of Spain; Christina of Savoy; the duc d'Anjou;† and Henrietta Maria, wife of Charles II, of England. One child died in early infancy in the year 1611. At the birth of this child, which came into the world feet first, M. Honore, a well-known man-midwife, was held in reserve in an anteroom, but he never passed the door of the queen's chamber, and Louise Bourgeois won the confidence of the court by delivering the child unassisted. This confidence remained unshaken until, more than twenty years later, Louise performed the same office for the wife of another duc d'Orleans, and lost her royal patient from septicemia three days after the birth of a daughter.‡

Without Ambrose Pare—or Ambroise Paræus—as his contemporaries called him—there would have been no Louise Bourgeois to head the long list of great French midwives. For at his call modern surgery and obstetrics awoke, and with it came not only Guilleméau,§ Honore, Clement, Moriceau, and Deventer, but first of all, in point of time and intimate association with the master, Louise Bourgeois herself. The surgeon is fond of remembering Pare for his work in gunshot wounds, for the new instruments his new art called into existence, and above all because he replaced the terrible *fer ardent* with the ligature. But the obstetrician remembers him because he called back from across the dark ages the ancient practice of podalic version in *cross births* and faulty presentations, and thus saved uncounted mothers and children from the horrible mutilations practised upon them with various extractors up to the end of the seventeenth century.

* Delacoux.

† "Borne looking toward the heavens." This prince became the duc d'Orleans in 1626 at the time of his marriage to Mdle. de Montpensier. He lived till 1660.

‡ See *Apologia de Louise Bourgeois*.—post.

§ Guilleméau was another pupil of Pare—probably the most distinguished, for he was surgeon to the king. If Pare revived podalic version, Guilleméau amplified and developed its uses. Guilleméau and his colleague Honore devised our present method of bringing down the foot in cases of hemorrhage from placenta previa. Between these two and Bourgeois existed a bitter and permanent feud, which culminated in the *Apologie* and the events immediately preceding it.



FIG. 2.—Loysa Bourgeois. From Gottfried Welsch.

Louise Bourgeois,* *sage femme juree*, was born in the Faubourg St. Germaine, near Paris, in 1563, about the time much of Pare's work was appearing in print "*Les Oeuvres Complet*," containing: The Book of Generation; Anatomy; Arquebuss Wounds, etc., appeared in Paris in 1561. The Book on The Plague appeared in 1568, shortly after the great epidemic. She was the daughter of a middle class family and received a better education than most women of that period; this fact will be obvious when we come to study her writings. Near by was the house of the great surgeon, and living under his roof was a certain barber surgeon named Martin Boursier. Boursier lived with Pare for over twenty years and during that time came to know and marry Louise Bourgeois. During the birth of their first child, she became interested in the study of obstetrics and shortly thereafter commenced to practise as an unlicensed midwife among the poor of her neighborhood. She was dexterous and tactful and was instructed by Pare and by her husband, and her education enabled her to assimilate so thoroughly the teachings of Pare that in later years when she became herself a teacher and a writer, she was able to reproduce a good deal of his instruction without giving any too much credit to the source whence it came.† In those days it was necessary in order to

* The second portrait is from Gottfried Welsch *Hebammenbuch*, 1628 and shows the interesting inscription omitted not only from Delacoux's lithograph but also from the cuts accompanying the articles by Goodell and Hunter Robb. It is probable that all of the engravings were brought down along the same channel from the same source, which Goodell says was a portrait by Hacquin. This engraving was by De Bry, as is shown in the following poem taken from Godfried Welsch.

AN DEN LESER

Der Künstler, Mahler Kupffersticher höchste Klag
Ist diese, dass ihr Kunst, und Fleiss Nichts mehr vermag
Dann nur allein des Leibs Gestalt und Angesicht
Zurbilden ab, und fürzustellen, doch gar nicht
Die Tugend, Kunst, Geschicklichkeit, Geist und Verstand,
Dadurch dess Menschen Seel gespeist wird und erkand.
De Bry aber den Mangel seiner Kunst erstatt
Dann er mit seinem Thun ein andere Meinung hat:
Die eusserlich Gestalt zwar für Augen stellt,
Künstlich, durch Bildnus nach dem Leben wie sichs hält.
Aber darneben der Person inwendig Gab
Mag man anso ihren Schrifften klärlich nehmen ab:
Dann was die stumme Bildnus nicht verrichten kan
Bey dieser Frawen, zeigen dir ihr Bücher an
Denselben dich gebrauch, verständig, und mit Fleiss,
Den lieben Gott in seiner Wunderwerken preiss.

† *Observations diverses sur la sterilité, perçut de fruit, fecondité, accouchements, et maladies des femmes et des enfans nouveau neez. Ampliant traittees et heureusement pratiquées par Louyse Bourgeois, dite Boursier, sage femme de la Roynie, Paris, 1609.* This book was translated into several languages. Original editions are rare. The writer has made use of a German version, bearing the date 1628;

become a licensed midwife—a sage-femme jurée—to stand an examination before a board of examiners composed of doctors and midwives. In her memoirs she writes entertainingly about her difficulties in securing her certificate from this board; not because she lacked the requisite skill, but because the female members of the board with prophetic vision feared the influence which her husband and Pare would subsequently use to establish her practice. This fear was evidently well grounded, for one of her examiners was madame Dupuis, whom she subsequently deprived of the patronage of the court and royal family.

When madame Bourgeois was thirty-six years old, that is, in 1601, she was called, not only on account of the court influences already referred to, but because of her many personal and professional excellences, to Fontainebleau, to attend Marie de Medici. Behold her then tucked into the boot of the royal carriage journeying with the queen and two court physicians to Fontainebleau for the approaching confinement. How she came to be selected over her competitors for the honor, how the carriage made the three day's journey of forty miles over the rough road of those days, and how a dauphin—the first for eighty years and the future king Louis XIII—was born at Fontainebleau, September 17, 1601, she has told us in her own naive and archaic *Recit veritable de la naissance de messeigneurs et dames les enfans de France, avec la particularitez qui y on este*.*

Let us darken the room, push back the clock 300 years, draw aside the curtain, and hear from the lips of this remarkable woman the "veritable recital" of how a French dauphin was borne in 1601.

II

THE BIRTH OF LOUIS XIII; HOW AND IN WHAT TIME THE QUEEN WAS CONFINED.

The night of the twenty-sixth of September, at midnight, the king sent to call me to come to the queen, who was feeling ill.

bound with the German edition of Gottfried Welsch, Habammenbuch, etc., 1651, found in the Surgeon General's Library at Washington. See also Hunter Robb in *Johns Hopkins Bulletin*, 1893, for an analysis of the scientific value of this book.

* Paris, 1626. The following account is translated from "Nouvelle Collection des Memoirs relatif a l'histoire de France." Michaud et Poujoulat, Paris, 1854, to be found in the Newberry Library, Chicago. Comment et en quel temp la reine accouche de Mons. le dauphin, a present Louis XIII, des ceremonies qui y furent observies, l'orde y tenu, les discours intervenus entre le roy et la royne, et sur plusieurs autres occurrences, par Louise Bourgeois, dite Boursieur, sage femme de la royne.

Also in the same library: Archives curieuses de l'histoire de France Depuis Louis XI jusqu'a Louis XVIII. Cimber et Danjou. Beauvais, Paris, 1837.

I was sleeping in the queen's dressing-room, where were also the ladies-in-waiting. These ladies often, finding me asleep, had previously played jokes on me by giving false alarms, and in such a manner that I thought this was one of the same, I heard myself called by some one named Pierrot, who did not give me time to fasten my clothes—he hurried me so!

Entering the bed-chamber of the queen, the king asked me—"Is this the midwife? Somebody said to him—"yes"—and he said to me—"Come, come, midwife, my wife is ill—look and see if it is really her confinement—she is in great pain." Having examined, I assured him that such was the case. At the same moment the king said to the queen—"My dear, do you remember what I have said to you a good many times about the necessity of having the princes of the blood at your accouchement*—I beg of you to permit it—it is for the future greatness of you and your child,"—to which the queen replied that she had always resolved to do whatever would please him. "I know well, my dear, that you wish to do all that I desire, but I know your nature, which is timid and embarrassed, so that I fear if you do not make a great resolution, seeing them may prevent your confinement.† That is why I beg of you not to be shocked, because it is according to the custom which always takes place at the first confinement of queens." The pains pressed the queen, and at each pain the king embraced her, and asked me if it was time to send for the princes, reiterating that I must warn him in time, as it was an affair of the greatest importance that they should be there. I told him I would not fail to do so when it was time.

About an hour after midnight, the king, overcome with impatience, seeing the queen suffer, and thinking that she would give birth to the child and the princes would not have time to get there, sent to seek for them. They were Messieurs the princes de Conti, de Soissons, and de Montpensier. The king said, waiting for them: "If ever any one has never seen three princes in deep trouble, one will soon see them now. These are three princes very full of pity and good nature, who, seeing my wife in labor, would give most of their possessions to be far away from here. My cousin, the prince de Conti, will not easily understand what any one says, seeing my wife tormented; he will believe it is the midwife who is doing it. My cousin, the kind de Soissons, seeing my wife's agony, will have deep solicitude at finding himself com-

* To prevent substitution.

† Evidently meaning that embarrassment might inhibit the pains.

pelled to stay; and as for my cousin de Montpensier, I fear he will fall down in his weakness, for he is not able to see any one suffer." All three came before the two hours, and were there about half an hour. The king, having learned from me that the delivery was not very near, told them to hold themselves in readiness until he called. M. de la Riviere, first physician of the king; M. de Laurens, first of the queen; M. Herouard, also physician of the king, with M. Guillemeau, surgeon of the king, were called to see the queen, and also retired nearby.

In the meanwhile, the great bedroom of Fontainebleau, which is near the king's bedroom, was prepared for the confinement of the queen. In it there was a great bed of crimson red velvet,

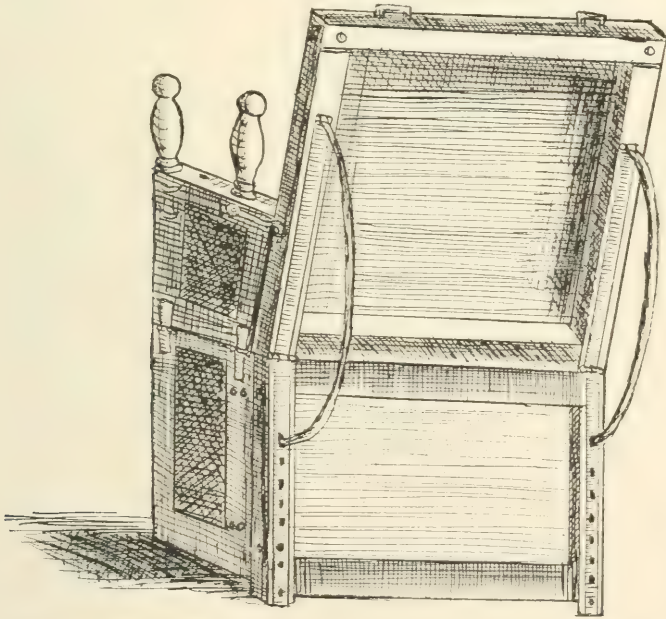


FIG. 3.—Dutch obstetrical chair, 1650. From Cornelius Solingen.

ornamented with gold, near the bed of accouchement. There were also two pavilions, large and small, attached to the floor. The large pavilion was stretched and fastened like a tent by its four corners with cords; it was of beautiful Holland linen, about twenty ells square. In the middle of the large tent there was a little one of the same linen, and under this was put the bed of accouchement. Here the queen was put to bed on coming out of her bedchamber.

The ladies whom the king had desired especially called to the accouchement of the queen were summoned. There was carried under the pavilion a chair, some folding seats, and some stools for the king, madame his sister, and madame de Nemours, to sit in.

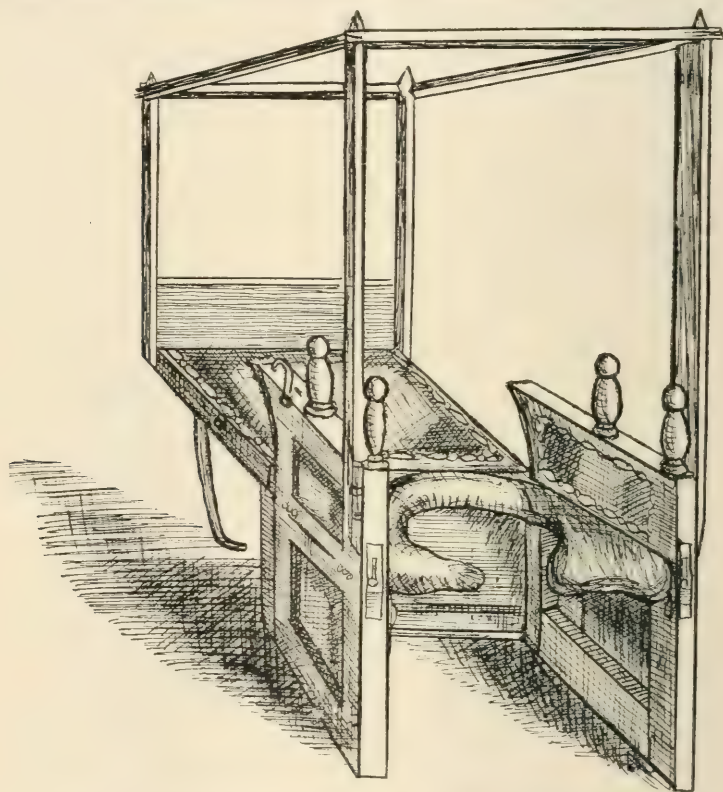


FIG. 4.--Dutch obstetrical chair, 1650. From Cornelius Solingen.

The obstetrical chair* was also brought in; it was covered with crimson velvet. About 4 o'clock in the morning a great colic,

* See prints. Many old-fashioned midwives of Ireland and the continent still favor confinements in the sitting posture. An old Kentucky woman once told the writer that in the early days of that state a chair was constantly used, and that it was often customary to have the seated husband hold the wife in his lap during the entire labor. It may be that this has accounted in the past for the smallness of Kentucky families. Jane Sharp in her *Compleat Midwife* (1680) states that she has heard this custom was also prevalent in Holland, but the following quotation from Cornelius Solingen stamps Jane as perpetrating a slander against the Dutchmen. It should be recollected that toward the end of the seventeenth century brave Admiral Van Tromp with his broom had left no pleasant recollection of the Dutch amongst the dwellers about the mouth of the Thames river. Says Cornelius: "Here in Holland in certain towns we have certain women called *Shootsters* who are used during confinements in place of obstetrical chairs and in whose laps the patients sit during delivery."

mingling itself among the travail of the queen, gave her terrible pain without helping her along. From time to time the king made one of the doctors come to see the queen and speak to me so that I might know what was taking place. The colic made the queen suffer more than the travail, and even kept her from it.

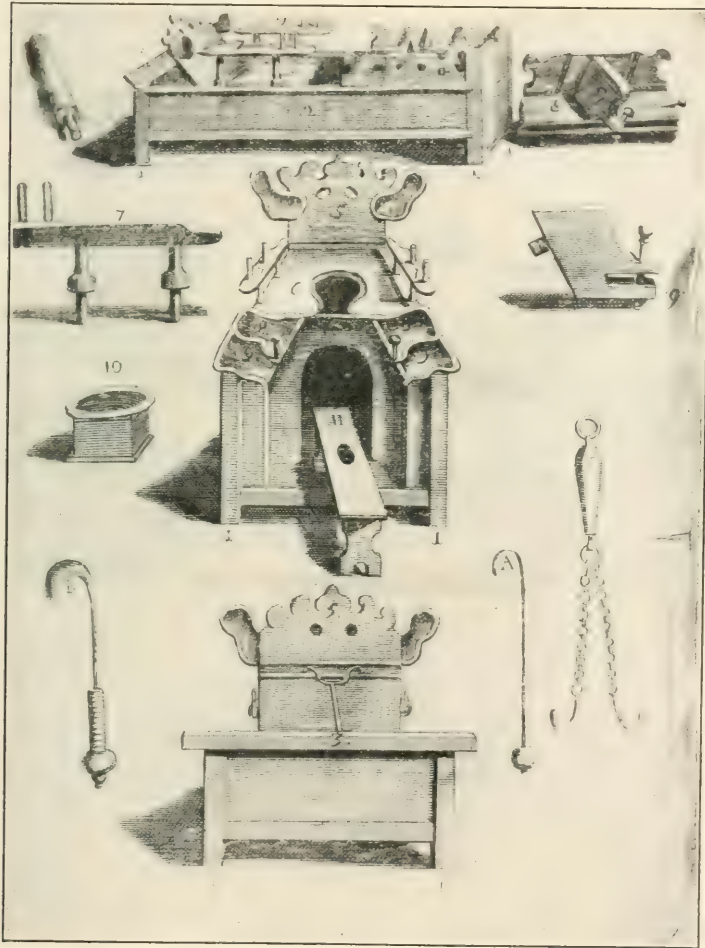


FIG. 5.—Obstetrical chair of 1600. From Justine Sieggemundins' Hof-Weh-Mutter.

The doctors asked me, "If this were a woman and you were alone with the case, what would you do?" I proposed to them some remedies which they ordered at once from the apothecary, who proposed to them others in the Italian style, which he said in

similar cases had done much good. Knowing the great zeal which the apothecary had in the service of her majesty, and knowing that if the remedy did not do all the good he claimed for it, it could not do her any harm, I made no protest, so they gave it to her.

There were also two old and wise Italian maiden ladies with the queen, who had assisted at the birth of many children and had attended many accouchements in their own country. The queen, to show her friendship for them, had wanted them at her confinement to serve her as ladies-maids. The relics of madame



FIG. 6.—Lateral facade of the Chateau of Fontainebleau. From the carp pond. The queen was confined in a room located on the second floor of the pavilion about the center of the picture.

Sainte Marguerite were on the table in the bedroom, and two holy men from Saint-Germain-des-Prez prayed God without ceasing.

The king said he did not wish any one to give any advice excepting the doctors, and that we should agree together, so that I can say I never saw anywhere such tranquillity and peaceful spirit because of the good order which the king brought there, and the assurances which the queen gave him.

To combat the insupportable colic, it was necessary to use a great many remedies. To these the queen made no resistance; for as soon as the king or doctors talked to her, she was content; and took them no matter how disagreeable they were. That is why many women, because of being so obstinate, have been the cause of things going wrong either with themselves or with

their children. The queen's sickness lasted twenty-two and one-fourth hours, and her courage was an admirable thing. She discerned clearly the first pains as well as those last ones when the terrible colic came. During all the time she was in travail the king never left her once, excepting when he went out for something to eat; then he sent constantly for news from her, and madame, his sister, did the same.



FIG. 7.—Courtyard at Fontainebleau. Seen from a window of Marie de Medici's bed chamber.

The queen, before her confinement, did not wish that the little M. de Vendosme* should come into her room during her illness, because of his youth, but she, on account of the pain, did not take note of his presence. He asked me every little while "if the queen would soon give birth." To quiet him, I said "yes." Then he asked me what the child would be, and I told him it

* The duc de Vendosme was the illegitimate child of the king and Gabrielle d'Estrees.

would be what I wished it to be. "What," said he, "is it not yet made?" I said "yes" that it was a child, but that I could make it a boy or a girl, whichever pleased me. He said, "midwife, since it depends on you, put the pieces of it into a boy." I said, "If I make a boy, Monsieur, what will you give me?" I will give you everything you wish, or rather; everything that I have." I

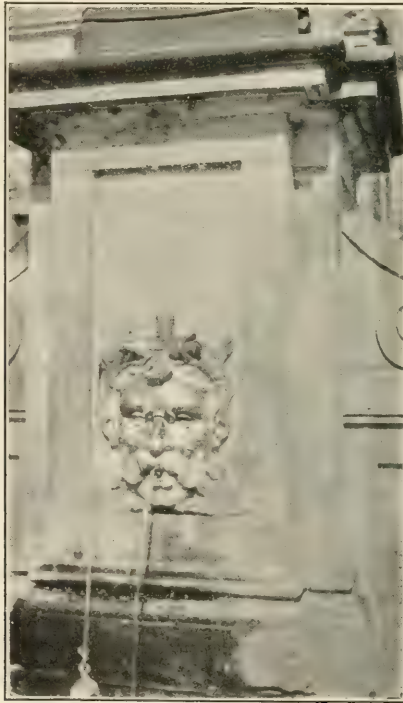


FIG. 8.—Old fountain Fontainebleau.

said, "I will make it a boy and will not ask anything of you but the honor of your kindness and that you will always wish me well." He promised me that, and kept his promise.

When the remedies had driven away the colic and the queen's real labor commenced, I saw that she restrained her cries. I begged of her not to suppress them, for fear her throat would swell.* The king said to her "My dear, do what your midwife tells you—

* The belief is still current in many parts of Europe that goitre-bronchocele—may be caused by holding the breath during the expulsive pains of labor. "Unter den Wehen das Haupt aber in etwas vor sich gebogen halten sollen, damit durch starke Athems holen in der Arbeit der Hals nicht kropficht werde." Nothwendig und Nutzlicher Hebammen Unterricht. Meiningen, 1682

cry, that your throat may not swell." She desired to be confined in her chair, and being seated, the princes who were beneath the large pavilion sat face to face with her. I was on a little seat before the queen. I placed M. le Dauphin in his linen wrappings, so that no one knew, excepting myself, what sex the child was. I wrapped him up well—this I understood was what I had to do. The king came near to me. I looked closely at the face of the child and saw he looked very feeble because of the great pain which he had endured. I asked for some wine from M. de Lozeray, one of the first valets de chambre of the king. He brought a bottle—I asked him for a teaspoon—the king took the bottle, which he held. I said to him, "Sire, if it was any other child I would put the wine in my mouth and give it to him that way, because of his great feebleness." The king put the bottle against my mouth and said "do to it as you would to another." I filled my mouth with the wine and thus gave it to the child. At that instant he was conscious and tasted the wine which I had given him.*

I saw the king sad and changed—he had drawn away from me. He did not know what sex the child was—he had only seen its face. He went to one side of the pavilion and told the two femmes de Chambre to get the bed ready. I nodded at Mdlle. de la Renouilliere to give her the signal,† so that she could go and get the king out of his trouble; she was fixing the big bed. Then I saw Gratienne; I said to her, "My girl, warm a piece of linen for *him*." Then I saw her go over to the king, who pushed her aside and would not believe what I had just told her. He said that it was a girl—that he knew it by my face. She assured him that it was indeed a boy and that I had told her so. He said to her, "She made a wry face." "Sire, she told you that she would make it," and he said to her "that is true, but it is not possible if it had been a boy she could have made such a face." She replied to him "It is possible, because she did it." Mdlle. de la

* Good old Dr. Goodell must have been nodding when he prepared his translation of this passage; the French is somewhat archaic, but the meaning is plain. The original reads: Le Roy vint aupres de Moi; je regarde l'enfant au visage que je vis lu une grande foiblesse, de la peine qu'il avoit endurée; je demande du vin a M. de Lozeray, l'un des premiers valets de la Chambre du Roy. Il apporta une bouteille, je lui demande une cuillere. Le Roy print la bouteille qu'il tenoit. Je luidis: "Sire, si c' estoit un autre enfant, je mettrois du vin dans la bouche et lui en donnerois, depeur que la foiblesse trop dure" Le Roy me mit la bouteille contre la bouche et me dit: "Faites comme a un" un antre. J'emplis ma bouche de vn, et lui en soufflay. A l'heure mesme il revint et savoura le vin que je lulu avois donne.

† Mdlle. de la Renouilliere and Gratienne were each anxious—for their own reasons—to have the honor of being the first to notify the king of the sex of the child, and each had arranged for her own exclusive code of signals.

Renouilliere came in. She saw the king was angry with Gratienne. She came to me and I gave her the signal. She questioned me in my ear and I whispered back "yes." She took off her cap and went to make reverence to the king. She told him that I had given her the signal and had also told in her ear that it was a boy. The color came back to the king. He came over to me beside the queen and bent down to put his mouth against my ear and asked me, "midwife, is it a boy?" I said, "yes." He said, "I beg of you, do not give me a short joy—that would kill me." I unwrapped the little Monsieur le dauphin and let him see that it was a boy, but so that the queen did not see anything. He raised his eyes to heaven, joining his hands, and gave thanks to God. The tears rolled down his face as big as large peas. He asked me if I had told the queen, and if there was any danger in telling her. I said "no," but I begged his majesty that this should be done with as little emotion as possible. He went over and kissed the queen and said to her, "My dear, you have had great pain, but God has been very good to us in having given us that which we asked of him—we have a fine son." The queen clasped her hands together and lifted them, with her eyes, toward heaven—bursting into tears, and then became very weak.

I asked the king to whom he wished me to give Monsieur le dauphin, and he said "to madame de Montglas, who will be his governess." Mdle. de la Renouilliere took the dauphin and carried him to madame de Montglas.

The king then went over to impress the princes with the weakness of the queen, then opened the bedroom door and invited in all the people that were out in the antechamber and the grand cabinet. I believe there were 200 persons, so that one could not move through the room to carry the queen to her bed. I was infinitely angry at seeing this. I said there was no reason for everyone coming in here; that the queen was not yet through her confinement. The king heard me and tapped me on the shoulder and said, "Keep still, keep still, midwife—don't be angry—this child belongs to the whole world, and everyone must rejoice over him." It was half past ten o'clock at night, Thursday, the twenty-seventh of September, 1601, day of Saint Cosme and Saint Damien, nine months and fourteen days after the marriage of the queen.*

* The same interesting collection of French historical memoirs from which this account is translated, contains also a description of the last illness and death of Louis XIII.

The valets de la chambre of the king and queen were called. They carried the obstetrical chair near the bed and the queen was then moved. Something was administered to her for her weakness, and having given her the service which was necessary, I took charge of M. le dauphin, whom madame de Montglas gave back to me. M. Herouard commenced then to wait on the child. He bade me wash it entirely in wine and water, and to look it all over before I bandaged it. The king brought up the princes and several noblemen to see it; all those belonging to the household of the king and queen saw the child, and then made places for others. Everyone was so glad they could scarcely express themselves. They all embraced each other without regard to who they were; they were so transported with joy they did not know what they did. I was told that through the entire town all night there were bonfires and the noise of trumpets and drums. Casks of wine were broken open, to be drunk to the health of the king and queen and the dauphin, and the messengers were sent out post-haste to all foreign countries to carry the news, and through all the provinces and towns of France.

As soon as the queen was put to bed the king had his bed made up near to hers, where he laid down to see that all went well with her.

The next day after dinner I found M. de Vendosme alone at the door of the ante chamber, holding aside the curtain of the cabinet through which one passed to go into the room of M. le dauphin. I stopped, very much astonished, and I said to him, "What are you doing there, Monsieur?" He said, "I do not know—scarcely anyone talks to me—no one says anything more to me." "That, Monsieur, is because everyone goes in to see M. le dauphin, who has just arrived. When everyone has greeted him, they will speak to you, as formerly." I told this to the queen, who felt very sorry for him, and said, "Behold, this kills the poor child," and ordered that everyone should caress him, as formerly. "Everyone is taken up with my son, and no one thinks of him, and that seems very strange to this child." The kindness of the queen was always very great.

The twenty-ninth of this same month I went to see M. le dauphin; the page, Biri, opened the door for me. I saw the room full: the king, madame his sister, the princes and the princesses were there, because they were just going to baptize M. le dauphin. I was about to retire, but the king saw me and said, "Come in, come in, you need never stay out." He then

said to madame and the princes: "I have seen many persons, but I never have seen any so resolute, be it man or woman, in war or elsewhere, as is this woman here; she held my son in her lap and looked at the whole world with those eyes as cold as if she held nothing at all—instead of a dauphin, and it has been eighty years since one was born in France!" I replied to this, "I have said to your majesty, Sire, that it was necessary for the health of the queen." "That is true," said the king, "and I did not tell it to my wife until it was all over, so that the joy would not upset her. Never a woman did better than you did; if you had done any different, my wife would have died. Hereafter, I shall always call you *Ma Resolue!*"

The king did me the honor to ask if I wished to be the nurse of M. le dauphin, and that I could have the same wages as the wet nurse. I begged his majesty to allow me to continue my profession, so that I would always be more capable of serving the queen, and so that he would always have near her an honest woman who understood her well. I remained near the queen to serve her in her bed one month, then eight days afterward, awaiting the return of his majesty from Paris, who had asked me to wait for him.

III

It would take too long to quote the entertaining accounts which this old midwife gives us of five other royal accouchements, but even at the risk of being accused of prolixity, we cannot pass by the interesting picture of contemporary life contained in the following incident occurring in 1602, just previous to the birth of madame Elizabeth, the future queen of Spain. The story carries its lesson even to twentieth century readers:

The queen being large with madame her eldest daughter, the royal family went to Fontainebleau for her accouchement. Immediately on their arrival, one could see numberless wet nurses busy soliciting the king and queen and everybody else with any influence. Since their majesties made the selection at Fontainebleau, it was necessary for each candidate to go there whatever it might cost, and the accouchement of the queen being expected soon, she made haste with her selection. In this connection a certain affair gave me a great deal of trouble. Among other candidates a certain man brought his wife for inspection; they had a little daughter, very delicate and pale. The woman appeared honest and came of such good people that some of the

first gentlemen of the court recommended her warmly to the doctors. She lodged with one of my friends who willingly engaged to speak for her, and she begged me also to do what I could. But I saw that her child was extremely thin, so when anyone spoke to me about her I did not respond very readily. Going one day to examine her, as was my custom, I heard this wet nurse spoken of by her husband's name. Then I remembered that this was the name of a young man whom my husband had treated for *la verolle*,* and who insisted upon leaving before he was cured. I had heard it said that no one could keep him from going away. He told my husband that he was cured, that he felt perfectly well, and that he was going to be married. When my husband remonstrated with him and told him what would happen, he only mocked at him. Two or three years afterward I saw some one from his town, and I asked news of him, knowing he was married. They told me that it was a long time since his return from Paris, but that he had trouble in his household, that his wife had had two or three children who were born diseased. I remembered that my husband had said he was not cured, and that if he married something would surely happen to him. Then I was very much troubled and wished I had never seen the woman. She saw that I changed color, and begged me to tell her the cause of it. I did not wish to do so, but she forced me by her prayers, and I told her that I did not take part in the selection of the wet nurses to do anyone harm and that I felt very sorry for her because she did not know what her disease was. Meanwhile, if she should be hired I would speak, but if she should not be hired I would not speak, but would let her go back to her own country. She was engaged, and they were preparing to dismiss all the others. It was time for me to speak. I sought Monsieur de Laurens, who had gone to a dinner party. When I found that he was not there to say when the other nurses were to be sent away, I begged Mdlle. Sauvage, *femme de chambre* of the queen, to go and tell her for me what the trouble was, which she did. She replied, "go back to the midwife and tell her she has rendered me a great service to-day; if I had been told this by any person but her I would not have believed it." The queen repeated this to the king, who said in a great rage that the wet nurse had come from a long distance to thus deceive him. He sent for Monsieur de Laurens and the other doctors to get at the truth, and to inquire how I could prove what I had said. I

* "The pox"—syphilis.

told them all, and for proof there was a valet de chambre of Monsieur Beaulieu-Ruze, who, living at the time in our apartments, had assisted in bandaging the man, and another surgeon at Auxerre who was with us at the same time, so my statement was verified. I was very sorry for the disappointment of the woman, but I owed it to my service with their majesties. They then selected another wet nurse.

IV

For twenty-seven years Louise Bourgeois served the court and royal family faithfully, and without mishap which could justly have been laid at her door. For every royal son, she received 500 crowns*; for every daughter 300 crowns, and the queen made her rich presents from time to time out of her own pocket. In addition she received 300 crowns for her two month's service during each confinement. Besides the gold cross and chain worn by other royal midwives, she wore, as a mark of special favor, the dignified and picturesque velvet cap worn by the royal nurses and never before worn by a midwife. De Laurens and Jacques de la Cuisse were her friends, but with Guilleméau and Honore she waged a successful but unceasing warfare of wit and sarcasm, not to mention the other less public weapons employed in those days by competitors for royal favor. These two old enemies, however, at last came in for their innings. In 1627 came her débâcle. She was getting on in years and should have retired, unblemished and gloriously, on the pension of 300 crowns, which she had drawn ever since the birth of Henry IV's last child. But ambition and avarice never grow old, and the retiring age, when not arbitrarily fixed, is apt to recede a year or so annually. In the year 1627 either the stars combined against her, or her hand had parted with its cunning, for she lost a royal princess from something which to our modern eyes looks suspiciously like a virulent puerperal peritonitis. It requires no stretch of historical imagination to guess at what followed. Ten medical gentlemen swooped down on the body of that poor little princess scarcely out of her teens and "posted it" with no more mercy or intelligence or regard for the truth than would have been displayed by a present

* A French crown or *écu* was the equivalent of the old English or Scotch crown worth from three to five shillings. The ordinary French crown was worth from three to five francs or *livres*. There were, however, gold and silver crowns of greater value. Very likely the denomination referred to was the ordinary crown, which would have a purchasing value of about \$1.50 in our present American money.

day Coronor's physician. Here is the protocol; Master Jacques de la Cuisse was present, but refused to sign it, and Brunier and Guillemeau signed it though not present:

PROTOCOL.

Protocol of the dissection of the dead body of her ladyship, the late Duchess. The reader is reminded that the duchess referred



FIG. 9.—Gottfried Welsch. First title page.

to was the Duchesse D'Orleans, wife of the Duc D'Orleans, one of the princes of the blood. She was before marriage Mdlle. de

Montpensier, daughter of the duchess of the same name, and but twenty years of age.

We, the undersigned: Franciscus Vautier, consulting court physician of the late queen; Peter Seguin, court physician of the

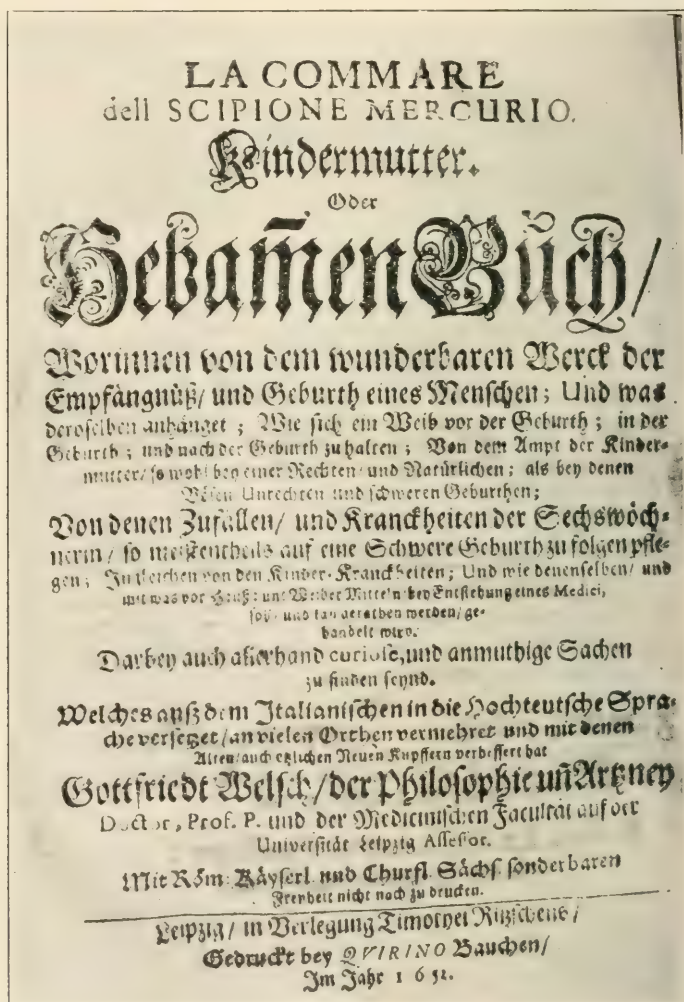


FIG. 10.—Gottfried Welsch. Second title page.

queen; Rudolff Maistre, Frantz Tournaire, court physicians of her late highness the Duchess; Abel Brunier, Doctor of Medicine; Carle Guillemeau, Doctor of medicine and surgeon of the king; Johann Menard; Simon Pimpernelle, appointed surgeon of the

dowager queen; Wilhelm Carillon and Frantz Neron, expert surgeons of the late Duke and Duchess, testify,

That we dissected the dead body of her ladyship, the Duchess, by order of her majesty, the king's mother; that we took notice of all inner parts, and found the cavity of the stomach and entire

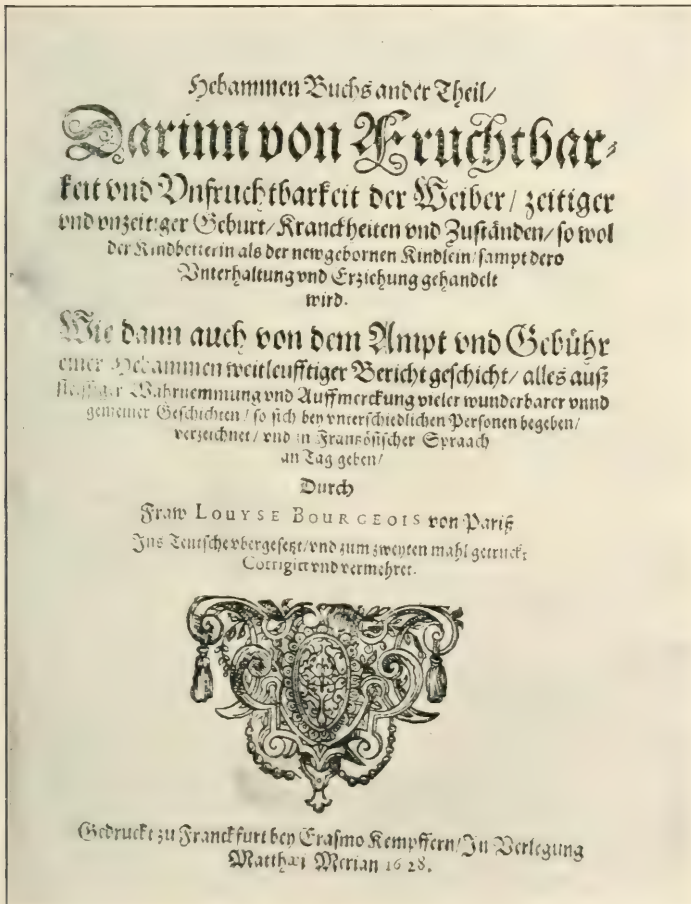


FIG. 11.—Title page. Second part of Gottfried Welsch. Note that this is a second German edition of Loysa Bourgeois.

contents of the abdomen filled with putrid matter. The intestines were inflated with gas, the stomach small and bloated, the liver shrunk and dry, the small bladder which contains the gall very much enlarged, the spleen larger than it should be, the kidneys small but in good condition, the bladder very small. The

That this is the exact truth, we testify with our own names and signatures.

Given at Paris, on the fifth day of June, 1627.

(Signed)	Vautier	Seguin
	Le Maistre	Tournaire
	Brunier	Guillemeau
	Menard	Pimpernelle
	Carillon	Neron



FIG. 13.—Title page of the Apologia in its German form. From Gottfried Welsch.

Yet one could hardly expect an old fighter like Louise Bourgeois to strike her colors, or to silently accept such a verdict, even though signed by the most distinguished French medical men of her day. And after reading her Apologia we must admit

that even if we cannot clear our minds of the suspicion that the Duchess's infection might have been introduced per vaginam by the midwife's fingers, instead of through a pair of old ruptured pus tubes which the learned faculty called cancer, she has at least cleverly established a *tu quoque* in her charge that her accusers failed not only to describe accurately what they saw but even to know at all what they were talking about. Her pen was dipped in gall, probably also in truth, when she wrote the following vindication, and none of the physicians dared to answer her over their own signatures. But her day was done; she was a dead hen in the pit; the protocol killed her; she confined no more duchesses and spent the rest of her years writing recollections which added nothing to her reputation and might better have been left unrecollected.*

APOLOGIA;†

Or justification of madame Loysa Bourgeois, Royal sage-femme, contradicting the report of the Doctors of Medicine.

I, the undersigned, having read the printed protocol of the dissection of the dead body of her late Highness, etc. which the doctors and surgeons who operated upon her ladyship, the Duchess, during her recovery from confinement, have written and published, by which they tried to justify themselves and put the cause of her death entirely upon my shoulders; find it necessary for the saving of my honor to reveal the entire cause, truthfully and thoroughly, of what happened after and during her illness; by which statement it will appear as clear as daylight that the cause of her death did not proceed from the small remains of placenta, as has been wrongfully stated in the protocol.

I wish to state that her Highness, the Duchess was, during the entire period of her pregnancy, in poor health. She was troubled at times with fever, flushes, and nose bleed, and during the last month with coughing, for which reason she had been bled three times. Shortly after her confinement she had fever which did not seem to subside. As far as the birth was concerned everything went well, thank God, not alone in regard to the child,

* Recueil de Louise Bourgeois. Paris, 1635.

† The Apologia and postmortem protocol are translated from Gottfried Welsch Hebammenbuch and bear the date Franckfurt, 1629. The French original appeared in 1627. The protocol here reproduced is verbatim, but the present writer has thought best, for the sake of space, to eliminate from the Apologia several pages of seventeenth century vituperation.

which was born in the normal way, but also as concerning the afterbirth, which was entirely natural and as it should be. She was later examined by Master Jacob de la Cuisse, an experienced surgeon who had a large practice in such cases. This examination occurred in the presence of the doctors, Vautier, Seguin, Le Maistre, Tournaire, Brunier, and Guillemeau, who all recognized that the above-mentioned afterbirth was normal and in proper condition; as to this I will pledge my life.

Concerning the small piece which the doctors claimed to have been from the placenta, and which grew so close to the matrix that it could hardly be scraped off with the finger, this was not in any way a part of the above-mentioned afterbirth, but the place to which the morsel of flesh commonly called the placenta is normally fastened, which place is more protuberant than the other inner parts in the body of the uterus until the puerperal woman has entirely recovered. This protuberance, or elevation, is really a part of the uterus, and is often taken out of ignorance—I will not say malice—for a part of the afterbirth. This mass could not be removed except with the use of a scalpel. It is well known that the uterus of a pregnant woman is for more than a whole month after her recovery from childbirth made up of many membranes, lying one above the other, like the layers of an onion. This lasts for more than a month before delivery and for about a week after until gradually the matrix shrinks. Therefore, it is proved that they have torn away this protuberant part of the inner membrane of the uterus, to which the afterbirth had been attached. Whosoever thought out this falsehood and tore this fleshy membrane off the uterus and declared it a piece of afterbirth has a poor knowledge of the art of which I am speaking. You show sufficiently, with your elaborate report, that you have no knowledge whatever of the nature of the placenta, nor of the matrix in women, either before her delivery and puerperal state, or after. You are as ignorant in these things as your Master Galeno, who, though he never had a wife and was hardly ever with pregnant or child-bearing women, yet took the liberty to dictate to midwives how to discharge their duties, and even wrote a book on this subject in which, however, he betrays that he never knew anything about the uterus of a pregnant woman or about the afterbirth. My opponents shall take upon themselves the disgrace and reproach, for having declared this normal uterus to be affected by cancer. The cause of the Duchess's death was an inflammation of all parts of

the abdomen, where, according to their own verdict, pus had collected, against which the uterus could not battle. This infection in such quantity could result from nothing else but from inflamed tissues and bowels, which finally developed cancer and caused the watery substance of the blood to retreat to the cavity of the abdomen, gradually changing into pus. Doctor Riolanus, in presence of the king, of the dowager queen, and of the Lord Cardinal,* announced the cause of her death (which could not be prevented) as nothing else but cancer in the lower parts of the abdomen. This part was swollen, as firm as a drum, and as if she had not been delivered of her child. Other doctors who were present agreed with him. Remember, also, that the Duchess suffered after her delivery until the hour of her death from continuous diarrhea, expelling often a greenish and blackish matter, denoting great fever and putrefaction in the bowels. This matter passing through the rectum caused the change in the adjacent matrix which you observed. Nor should you have omitted from your protocol the following important facts, had you spoken the truth faithfully: You should have told how much her abdomen was swollen as well before as after her death, which would have been proof enough that the cancer was of the bowels. This necessarily causes an inflammation lasting longer than twenty-four hours. Neither should you have failed to describe the various parts and state their color, as important changes take place in these cases, and certain symptoms may be taken as the forerunner of death. In plain language, you simply will not admit that it was inflammation and cancer of the intestines. Nor have you spoken clearly even of the uterus, the size of which you certainly should have described. All you noticed is that her lungs were sound, not adherent to her sides, that her brain was normal and without any defect.

I am convinced that if honest, expert professionals in this matter had been chosen as judges, they would never have approved of your invention concerning the placenta, which subject you had canvassed already before the postmortem, with the intention of accusing me of her death. These men would not have allowed you to name in your report those persons who were not even present; for instance, Ms. Brunier and Guillemeau, nor was there any mention of the surgeon, Master de la

* Richelieu: The Cardinal himself was in scarcely less trouble over this Madame Bourgeois; he was accused of having, for reasons of state, poisoned both the Dutchess and her offspring. The infant lived to write her own memoirs.

Cuisse, who assisted me during the confinement of her Highness. He was present during the dissection and declared that the injured part was not the placenta but was the result of using the nails and scalpel on a part of the fleshy membrane which nature had left inside the uterus—all of which should be sufficient to prove your report mistaken and untrue.

I have practised my profession now for fully thirty-four years, faithfully, diligently, and honorably, and acquired not only a good certificate, after various examinations, but have also written books treating on this subject, which have been printed and published in several editions and were translated into foreign languages, for which trouble many noted physicians have rendered me thanks and have gladly confessed that they were of great use to humanity. If I had knowingly left a piece of the placenta inside the matrix, I should have mentioned it in time, in order to have asked advice and help. And should I not have known it easily enough by simply examining the placenta? Such a mistake would have been evident within twenty-four hours, by symptoms which never fail to develop in that time. As none of the conditions referable to retained placenta appeared and the lochia showed neither bad color nor odor, you men of science who are such experts in the diseases of the child-bearing woman, should have warned us to prepare for other dangers.

Besides, let me tell you, that if a small piece of the placenta should have remained inside (which, however, did not happen) it would have decayed and detached itself and passed normally with the lochia, which flowed incessantly until the day of her death. We have this experience daily in our practice. On the fourth day after the birth small and tender fibers were passed normally, as fine as a spider's web, which the specialists call amnion and chorion. You will probably contradict this. However, I wish to reply that Hippocrates, whose experience in female troubles and diseases is very famous, declared that the wife of a tanner who had been confined normally had passed on the fourth day a piece of membrane, without any accident or dangerous consequences. This great and excellent man wished to give posterity to understand that this is as a rule neither harmful, not of great consequence or danger.

No one could claim after reading the treatises of noted scribes that a small piece of placenta which was dried up and attached to the uterus without putrefaction ever caused death. I read myself in Paulo Aegineta's work on surgery, that no doctor need

be surprised to find pieces of the placenta discharged even on the fourth or fifth day after confinement of some women. I am also informed that a famous surgeon and anatomist, called ab Aquapendente, was of the same opinion and asserts that he had seen many women who evacuated the putrid placenta in pieces, yet did not die of it.

So you see, you gentlemen of the Faculty, that you made a great blunder in attributing the cause of death to this invented story of the placenta. Why did you not rather ascribe it to the lasting attack of fever, which affected the patient before as well as after the birth, or to the cough which tormented her before and after confinement, or to diarrhea, which appeared too soon after? Every one of these three diseases are dangerous for a puerperal woman, and you should have considered them with more judgment and insight.

If you wish to learn something about the secret troubles and diseases of women, you should associate often with midwives and assist them in the treatment of child-bearing women, not only once or twice, but often, like your great Master and Law-giver, Hippocrates, who had no aversion to meeting and consulting with midwives or to asking for their help.

These things I have found it necessary to explain to you, for the sake of my honor, and in my defense, against the calumnies which were spread against my good name and reputation. I will gladly submit to the verdict of medical experts in Paris and elsewhere (besides those others who take a great interest in this matter) as well as to that of those persons whom her majesty will be pleased to choose for my justification.

Given in Paris, June 8, A. D. 1627.

LOYSA BOURGEOIS.
dite Boursier.

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IN MEMORIAM.

JOSEPH E. JANVRIN, M. D.

The following is a memorial to Dr. Joseph E. Janvrin submitted by a committee of the Woman's Hospital Society of New York.

January 15, 1912.

THIS Society has learned with deep regret of the death of its esteemed member Dr. Joseph E. Janvrin and while expressing its sincere sympathy with the family of the deceased, wishes also to voice its appreciation of the sterling worth and valuable attainments of its late member.

With a gifted mind he had so perfected himself in the pursuit of his high calling that he had become a trusted counsellor, not only in the sick-room which claimed his services, but also among his professional brethren, when his voice was oft raised to encourage or admonish, as befitted the occasion.

His high standard of character and his amiability of temperament made him a welcome participant in all social gatherings as well; and his enlightened conversation appealed to all his comrades as indicating the highest type of man, entitling him to the warm friendship of all his associates.

We beg that his family will accept on the part of the Society of the Woman's Hospital its heartfelt tribute to his great worth and its sincere expression of the sense of personal loss to each member.

J. RIDDLE GOFFE	} Committee.
CLEMENT CLEVELAND	
BACHE McE. EMMETT	

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of March 12, 1912.

The President, WILLIAM E. STUDDIFORD, M. D., in the Chair.

DR. CHAS. G. CHILD reported a case of

CHORIOOMA.

This patient was twenty-six years of age and had been married five years. She had had one child four years previously; the labor had been normal and the puerperium uncomplicated. Menstruation had begun at the age of eleven and had been profuse and accompanied by severe pain. Last October she had a miscarriage at five months which was followed by a normal convalescence. The patient menstruated normally in November and December, but on January 18, four weeks after the last menstruation she began to flow profusely and had considerable pelvic pain. This continued, though moderated in severity, until the latter part of February, when the patient was put to bed. When Dr. Child saw her on March 3 the uterine cavity measured 4 1/2 inches in depth and was smooth and regular in all directions except at the fundus. Here there was a softened area about 2 1/2 inches in diameter, somewhat raised in spots, depressed in others. At one point the uterine covering of the examining finger seemed hardly thicker than peritoneum. It was difficult to remove any of the tissue at this site with the finger. What was removed for examination was by means of placental forceps and curet. The uterus was irrigated and packed and convalescence was uneventful.

Two pathological examinations were made. The first pathologist reported that the tissue was sarcomatous in character but was made up of decidual and syncytial structures. It belonged to that type of neoplasm known as deciduoma malignum, and consisted of muscular and fibrous tissue infiltrated with large cells, decidual in type, together with masses of cytoplasm containing many nuclei. Its vascularity was striking and the vessels consisted largely of an endothelial coat which would suggest that metastasis might readily be produced. There was little or no inflammation. This pathologist advised immediate extirpation of the uterus.

The second pathologist reported that he did not feel entirely certain about the case but thought it was probably Marchand's atypical chorioma, which was the same as Ewing's third variety of chorioma called syncytial giant cell. In any case with a

large uterus and bleeding there was great danger of infection and death from hemorrhage and peritonitis, and the uterus could probably never be of any use and hence ought to come out.

It was now one week since all the gauze had been removed from the uterus and the organ had contracted well, though still slightly enlarged. There had been no further bleeding. On bimanual examination the fundus which could be readily palpated between the two hands was still exceedingly tender. The patient had no pelvic pain but had not been out of bed on her feet as yet.

The second pathologist had withdrawn his recommendation to remove the uterus.

The question in this case was what should be the future treatment.

DISCUSSION.

DR. BROOKS H. WELLS said that while he would prefer immediate operation it would be justifiable under the circumstances to wait; if there should be the slightest return of the symptoms the uterus should be promptly removed.

DR. HERMAN J. BOLDT said that several similar cases had been reported, and he remembered one in particular which had been reported in Leipzig where the diagnosis was positively made of a malignant form of deciduoma. The patient, however, recovered after a curetage, with intrauterine treatment, without anything further being done.

It was reported by Dr. Child that the uterus, after cureting, contracted, and she was in better condition than when she first came under his observation. These patients should be kept under careful observation and upon the slightest recurrence of bleeding Dr. Boldt believed that the uterus should be removed.

DR. H. N. VINEBERG said with the clinical history as stated and with the findings by digital exploration as given by the doctor he would be inclined to attach more importance to them than to the report of the pathologist from the scrapings, and he would in all probability have considered hysterectomy indicated. As he had stated several times in discussion, from the nature of the condition, the pathologist's findings from the scrapings might prove misleading, as occurred to him in a case which he had already reported. But it would seem to him that now he would keep the case under very close observation and on the first recurrence of profuse bleeding he would remove the uterus.

DR. HOWARD C. TAYLOR believed that there was only one thing to do for a malignant deciduoma and that is to do an hysterectomy unless the case is too far advanced for such an operation. While it is possible that some cases might be cured by a cureting, the distinction between such a case and a more malignant one is difficult and one would be taking a great risk to decide that a given case was of such a type.

DR. C. G. CHILD said that in these cases of irregular bleeding, hysterectomy was indicated. At the end of three weeks the patient would be anesthetized and the interior of the uterus again carefully explored. If there were found the slightest evidences of the growth remaining a hysterectomy would be performed. A further report of this case he would make at a subsequent meeting of the Society.

DR. BOLDT presented an exceptionally large

HYDATID OF MORGAGNI

which was diagnosed either as an ovarian cyst. Because of existing menorrhagia during the past six months, and the tension of the tumor wall, the possibility of a pedunculated soft myoma was also considered. The diameter of the hydatid is $4\frac{1}{2}$ inches. On two former occasions hydatids of nearly this size were operated upon by him.

The second specimen was a uterus and vagina, removed by

PANHYSTEROLECTOMY

because of total prolapsus, from a patient sixty-five years old. The operation is always preferred in such cases, when there is an understanding that the vaginal canal is of no further use to the patient; since it is the only operation by which a cure can be guaranteed without the possibility of a recurrence.

DISCUSSION

DR. JOSEPH BRETTAUER said that the specimen demonstrated by Dr. Boldt reminded him of a case which he had operated upon recently. The patient presented all the typical clinical symptoms of an ascites. He, as well as several other men who had examined her, were inclined to believe that there was free fluid in the abdominal cavity, until the patient reminded him that he had seen her eleven years ago and had advised operation for an ovarian cyst.

The abdomen was then opened and a very thin-walled par-ovarian cyst which contained nine quarts of clear fluid was found. The deceptive symptoms were explained by the absence of any tension within the cyst wall.

DR. WM. E. STUDDIFORD presented two

WOUND RETRACTORS.

which he had used in a large number of cases and with entire satisfaction. In abdominal work when it was necessary to use pads, the pads were held in the grasp of the retractors and gave little trouble. They were very light in weight and easily handled.

DR. RALPH WALDO LOBENSTINE read a paper on,

"VAGINAL HYSTEROTOMY IN THE LATE MONTHS OF PREGNANCY."*

*For original article, see page 773.

DR. GEO. W. KOSMAK read a paper on,

"VAGINAL CAESAREAN SECTION AND ITS LIMITATIONS, PARTICULARLY IN ECLAMPSIA."*

DISCUSSION.

DR. WILLIAM S. STONE said these surgical measures for the relief of really serious emergency conditions should not be done by those who were not experienced in this line of work. Vaginal hysterotomy was an operation that all had looked forward to as one that might be very useful, more so that it had been in the past. The papers that had been read had been a disappointment to him. The reader of the first paper gave them statistics that were gathered from foreign clinics and he presumed that from a sense of modesty he gave no personal experiences. In closing the discussion he hoped that Dr. Lobenstein would add some information regarding his own experience with this operation so that comparisons could be made with the results obtained in the foreign clinics.

DR. AUSTIN FLINT, Jr. was very much interested in Dr. Lobenstein's paper, which brought up questions about which there were many differences of opinion. For a good many years Dr. Flint belonged to that class, described by Dr. Lobenstein as being the radical class, in the treatment of eclampsia. He believed that a pregnant woman who had convulsions was toxic, and that the sooner the fetus was delivered the better for the patient. He also believed that whatever operative procedure was undertaken to deliver the woman the choice should be made of a procedure whereby the labor could be terminated with the least possible traumatism and the greatest speed. The choice, therefore, depends mainly on the condition of the cervix. His experience with the vaginal hysterotomy had been rather unfortunate, the first case was not a simple one by any means. The difficulty was not so much in the performance of the operation as it was in the subsequent delivery of the child. He pulled the cervix down so that it could be easily seen, and then made his incision, using scissors for the purpose. Although the bladder had been separated from the anterior uterine wall, and was high up, it was wounded owing to the fact that a fold of the bladder came down just at the moment when the incision was being further enlarged. There was great difficulty in sewing up this wound in the bladder. The patient made a good recovery, although she had a fistulous opening into the bladder. At a subsequent operation to repair this fistula, he found a great deal of scar tissue between the bladder and the uterus, which made the secondary operation very difficult. Ultimately the patient made a splendid recovery. The difficulty in the operation was principally in the delivery of the child. This was apparently due to the fact that traction

*For original article, see page 793.

which was made on the cervix for the purpose of controlling the hemorrhage interfered with the descent of the child's head.

In a general way, in the later months of pregnancy it is better to leave the patient alone and allow the cervix to become soft, rather than attempt to deliver through a long and rigid cervix. When a woman begins to show symptoms of toxemia and impending convulsions, he advocates elimination through all the possible channels; that is, the bowels, the skin and the kidneys, with a restriction of the amount of food given and *not* a great deal of water. At the same time a bougie or a bag may be inserted. Very often at the end of a few hours an entirely different condition of the cervix is presented. Instead of its being rigid and long and hard, that is, a condition requiring operation such as hysterotomy, the cervix is soft and partially obliterated and would require only some simple obstetrical procedure, such as the introduction of a larger bag, or a manual dilatation, followed by a podalic version. The patient's condition would be far better and better ultimate results could be obtained. However, this was a subject about which opinion changed considerably and we all wish to learn more about it. The relation of personal experience helps very much in this regard. Dr. Flint would hesitate very much in employing vaginal hysterotomy in cases of placenta previa. In the first place because it is impossible to determine where the placenta is attached; in the second place, the cervix is very friable and easily torn. It seemed to him that even abdominal Cesarean section in such instances was not justified, and in cases in which it had been done the statistics were bad. He did not believe that abdominal Cesarean section was justifiable in eclampsia excepting where it was complicated by a contracted pelvis. In such cases the operation was imperative; he would therefore perform this operation, not for the eclampsia, but in spite of the eclampsia.

To sum up, it seemed to him that the original management of such cases would be, first, elimination, followed by the rapid delivery of the patient by means of some method of dilating the cervix either manually or with bags. The indications for hysterotomy would be restricted to cases in which the cervix could not be dilated rapidly and the question of haste in delivery was imperative.

DR. FRANKLIN A. DORMAN said he was very much interested in both the papers read and it was difficult to take any exception to what Dr. Lobenstine had stated because he had qualified most of his statements. He felt sure that a certain number of cases of eclampsia required the more radical operation, and there were certain cases where the indications for a vaginal hysterotomy were very definite. If a woman had a convulsion and showed signs of extreme poisoning, there was no question in his mind but that the uterus should be promptly emptied. He realized that some of these cases were lost through shock; but also that some of the babies were liable to die in utero. In

some cases he might be satisfied to wait for nature to create changes in the cervix and, in waiting for this, elimination should be employed. One should always in these cases try to assist nature. He advocated the use of the bags; their use did not add to the shock of the patient; really was preparatory to the work on the cervix and considerable dilatation could be often accomplished in a short time. Then one might do a modified vaginal hysterotomy with an incision that did not extend very high up into the uterus.

In the matter of placenta previa, he agreed with what had already been stated; there was great danger from tearing because of friability. In dilating the cervix in these cases, there was the additional danger of tearing into the broad ligament. In these cases it was often imperative to employ something else than dilatation. More stress should be laid upon abdominal section in these cases of placenta previa.

The indication for the performance of this operation in the delivery of hydatidiform mole seemed far fetched. It seemed to him that the parts could be sufficiently dilated to get this pulpy mass out fairly rapidly, and the hemorrhage could be controlled by tampons.

Dr. Dorman could hardly conceive of the use of such an operation in cases of prolapse of the cord. By posture the cord could be gotten back and maintained in position by bag if necessary until adequate dilatation was accomplished.

DR. GEORGE GRAY WARD, JR. said that he had listened to the reading of the papers with much pleasure especially as they brought out the different points of view of the subject. The operation of vaginal hysterotomy had, in his opinion, a place but only in the hands of one accustomed to vaginal operations. Of course, the operation best indicated in each individual case should be chosen, as vaginal hysterotomy had a limited field. There was one point that Dr. Lobenstein brought up that was interesting to him, and that was the effect which such an operation might have on subsequent labors; how would the scar behave in these cases? Dr. Ward had had one interesting experience where he had done the operation twice upon the same woman; at the second operation the scar gave him much concern because the anterior wall was very much thinned at the lower uterine segment as a result and tore readily, it being difficult to limit its extent. This patient came to his office three days ago. She wanted to become pregnant again and asked regarding the possibility of it being a serious matter if she did. Dr. Ward was inclined against her becoming so. This was a case of severe toxemia of pregnancy with excessive and continuous vomiting in a patient with exophthalmic goiter and in whom he had used hypodermically the thyroid extract prepared by Beebe from normal human thyroids. In this case, there were no convulsions, but there was an alarming state of the urine as shown by the nitrogen output. This was a case where con-

servatism could not have been carried out. There was no choice but an induction of labor and there was not the slightest chance of her dilating the cervix unaided. After a fair trial with the bags the vaginal hysterotomy was resorted to, and was not difficult. In the second pregnancy, which behaved as the first, the operation was complicated by the cicatrix of the previous incision.

DR. BROOKS H. WELLS thought there was one point in the discussion that had not been brought out sufficiently, and which might modify indications for operation. Broadly speaking, the toxemias which occurred during pregnancy might be divided into a number of classes, for instance there was one where the kidneys were primarily or mainly affected, with the appearance of albumin and casts in the urine; in another the urine, otherwise normal, would be found to contain acetone and diacetic acid. With acetone and diacetic acid in the urine there might be found as well tenderness over the pancreas and this Dr. Wells referred to as the pancreatic type of toxemia. The symptoms in this type could be controlled in many cases by large doses of bicarbonate of soda. Following this administration the symptoms would promptly cease and the patient go through labor normally. The differentiation of the toxemia as influencing the indications for treatment was a point he believed worthy of careful consideration.

DR. H. N. VINEBERG said that since vaginal hysterotomy had been so condemned he thought he should have the right to say a word in its defense, for he was much surprised to hear such condemnation. He had done this operation four or five times and, it seemed to him, this was the proper procedure in selected cases and he had met with success in this treatment of his cases. They all knew the difficulty of emptying the uterus which contained a four, five or six months fetus and which was filled with hydatidiform mole. This was attended by much bleeding. By such an incision through the cervix the work could be done in a more simple manner. One great advantage was that one could palpate the interior of the uterus to determine whether there was present a malignant growth or not, such as he had found in one case. Another advantage was they could be more certain of emptying the uterus completely, such as could not be done by any other method.

Packing the uterus with gauze after this operation he had found unnecessary, but he would like to hear from those present their experiences with this work and if, in general, they had had unfortunate experiences.

He felt he ought to say something in favor of vaginal hysterotomy in hydatidiform mole, notwithstanding the remarks of the reader of the paper and those of Dr. Dorman. He had used the method in several cases for the past three years and he could not see how anyone could find anything to condemn in it. He would ask the two previous speakers if they had had

any untoward experiences with it to justify their attitude regarding it. Dr. Dorman stated that in hydatidiform moles he cures and employs gauze packing to arrest further bleeding. Now by making use of vaginal hysterotomy packing is unnecessary, as with the hand inserted in the uterus all the vesicles can be removed and there is no fear of further bleeding.

Dr. Vineberg asked Dr. Lobenstine if in cases of vaginal hysterotomy at or near full term, with a long narrow undilated cervix, whether he did not find some difficulty afterward in suturing accurately the cervix and obtain sufficient drainage for the puerperal uterus, for if he restored the parts to the condition prior to operation, he would again have a long narrow cervix and that would necessarily offer an obstacle to the free discharge of the lochia.

DR. A. A. HUSSEY had enjoyed the reading of the papers very much. All had found ground for support of their individual views. He had passed through the different stages described by the writers as conservatism, moderate conservatism, and radicalism. About two years ago he was in the acute stage of an attack of conservatism which lasted until he had followed the method of Tweedy in eight cases of antepartum eclampsia. His results had been so bad that he had turned to the radical school, and now at the Low Maternity they deliver these cases as soon as they are admitted. They try to be as conservative as possible in the delivery. If the cervix is fully dilated or easily dilatable, they deliver at once with the forceps. If, however, the cervix forms an obstruction, delivery is preceded by vaginal hysterotomy. After the emptying of the uterus, the eliminative treatment is continued in the usual way. Elimination is the only form of treatment that we know of that does any good and we believe in beginning with the elimination of the child.

In looking over the records of the Brooklyn Hospital for the past fourteen months, he had found eleven cases of eclampsia which had been treated by Dr. Pomeroy, Dr. Zimmermann, or himself. Two of these cases had been treated conservatively until labor was well advanced, when they were delivered by forceps. Both died. One case was treated medically, and died after three convulsions, undelivered. The next eight cases were operated upon immediately, and all the mothers and six of the babies recovered. One, a primipara, was delivered by Dr. Zimmermann by Cesarean section. Both mother and child are living to-day. Seven were delivered by vaginal hysterotomy; two by Dr. Pomeroy, one by Dr. McChesney, four by Dr. Zimmermann and himself. Of these all the mothers made good recoveries, and five of the babies left the hospital living and in good condition. One of the babies was stillborn, one died eight days after birth of prematurity.

His experience with vaginal hysterotomy was limited to eleven cases of his own, too few to be of any value, but his

results with the operation in eclampsia so far would lead him to continue its use in certain cases.

With regard to the technic of the operation, in his work he had found a modification of the classical operation helpful. Instead of using the volsellum, he preferred heavy silk traction sutures inserted in each side of the uterine incision and used to pull the uterus down into view. The advantage they offer over the volsellum is that they do not have to be removed in doing the extraction of the child, and they make the identification of the uterine incision easy when the final suturing is being done. He also makes use of a rubber bag, which is passed through the cervix and used as a tractor and hemostat. He has used it in three cases and has been gratified to note the ease with which a high cervix can be pulled down in this way. One also got a clean field in which to work because of the blanching of the tissues by the pressure of the bag. He thought this operation had a definite field of usefulness in obstetric work.

DR. C. G. CHILD did not believe in ultraconservatism in treating these cases of eclampsia. In all cases dilatation could be accomplished by the mechanical dilator of Higgins. If the patient was in the hospital a vaginal hysterotomy would be preferred by him. He did not think it was fair to condemn the mechanical dilator for opening up the cervix in these cases. Its use accomplished the results desired quite rapidly, often not taking over three-quarters of an hour to an hour. The results were very satisfactory, more so than with the bags. There was one great advantage in the use of mechanical dilatation over vaginal hysterotomy and that was that the vulva could be dilated at the same time that the cervix was.

In cases of placenta previa he had not performed vaginal hysterotomy, but would prefer Cesarean section by the abdominal route. There was a much wider field for this operation than was granted it at the present day. The treatment should be a rapid one; the quicker the work was done the better for the patient.

DR. RALPH W. LOBENSTINE said in closing the discussion, that he felt that the operation of "vaginal hysterotomy" was still regarded in this country with a considerable degree of suspicion; but he felt that it had a distinct field of usefulness when employed by the expert.

In regard to what had been said about the true conservative method of treating eclampsia, Dr. Lobenstine believed that careful statistics, both abroad and in the United States, showed clearly that the radical treatment—in the hands of the skillful obstetrician—promised better results to both mother and child. Vaginal hysterotomy causes much less shock than the difficult manual dilating of a rigid cervix; but the operation should be done early, in order to obtain really good results. In unskilled hands, the conservative method was the "method of choice."

In answer to Dr. Stone's remarks, he said that he did not

refer to his own cases, partly because of lack of time, and partly because a series of fourteen cases was too small to warrant the making of deductions therefrom.

Dr. Lobenstine replied to Dr. Flint's question about the cause of difficulty in his cases of forceps delivery after vaginal hysterotomy, that the only cause for such trouble could be "an insufficient amount of room." Forceps, in the long run, do not give as good results as version, where the latter is safe and possible of execution.

Dr. Lobenstine further stated that he took exception to what Dr. Dorman had said in regard to the use of the operation in "hydatid mole"; he believed, as Dr. Vineberg had pointed out that it was an excellent operation in certain unusual cases of this complication, where there was a great deal of bleeding with a long rigid cervix. He thanked Dr. Hussey for mentioning the introduction of the rubber bag before performing vaginal hysterotomy. Dr. Lobenstine said that in many cases this procedure would simplify the operation; it would prove especially valuable in case the operations were performed in "placenta previa."

The instrumental dilatation of the cervix, as advocated by Dr. Child, Dr. Lobenstine did not think could take the place of vaginal hysterotomy.

In closing Dr. Lobenstine desired again to state emphatically, that *conservatism* should be employed wherever possible.

Dr. G. W. KOSMAK, in closing the discussion, said that some of the members evidently did not understand the purport of his paper; that he did not intend to condemn the operation of vaginal Cesarean section but simply to urge a restriction in its application. In employing this procedure, it is quite evident that many operators did not take into consideration the various etiological factors present in eclampsia and it was quite generally recommended that the operation be done as soon as the first convulsion appeared. As Dr. Wells had correctly stated, eclampsia was not due to any one cause, the main one being a circulating poison which may have been elaborated by the placenta, but this had by no means been definitely proven. In regard to Dr. Dorman's reference to bag dilatation occupying twenty-four hours, Dr. Kormak stated that he had often been favored with more rapid results, only eight or nine hours being needed for sufficient dilatation.

It was very important that these cases should be properly handled before the convulsions appeared and the prophylactic treatment of such toxemias was the most important factor. Albumin, indican and acetone, should always be looked for in the urine of pregnant women and proper steps instituted as soon as these abnormalities are recognized.

Regarding the use of saline solutions, the speaker considered that they were usually contraindicated in these cases of toxemia as the use of salt must be restricted as much as possible. Better

results could be obtained, as suggested by Jacobson, with the use of the sugar solution in place of the salines. No large amount of fluid should be injected under the skin, however, because of the additional work thus imposed on the kidneys, particularly where a subcutaneous edema was present.

The question of blood pressure, in eclampsia, was also a very important one and in the speaker's opinion it seemed a mistake to attempt to reduce it too suddenly. A certain rise in the blood-pressure must be looked upon as a physiological phenomenon and necessary to insure proper elimination. Veratum viride was undoubtedly successful in reducing blood-pressure but the effect was brought about very suddenly and often persisted. Nitroglycerine, on the other hand, gave much better results because its effect was transitory and noncumulative.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of February 23, 1912.

FRANKLIN A. DORMAN, M.D., *in the Chair.*

EXHIBITION OF CASES OF MALIGNANT DISEASE TREATED WITH ANTISERUM.

DR. WM. M. FORD presented these cases. In one there was a healed carcinomatous ulcer of the chest. Another was a woman, well nourished, who had had carcinoma of the bladder but now bore no evidences of it.

POSTABORTIVE SEPTIC FIBROID TUMOR OF THE UTERUS. HYSTERECTOMY. RECOVERY.

DR. HIRAM N. VINEBERG reported the case of a woman who had been married two years. Her menses began at her fourteenth year, were regular, and of the average duration and amount. She became pregnant for the first time three and a half months ago and Dr. Vineberg was called into consultation November 11, 1911. The history given was as follows: About two weeks before she began to suffer with pain in the lower part of her abdomen and consulted her family physician who found that the uterus was of a size corresponding to the gravid organ between the sixth and seventh month. From the size and hardness of the uterus, he readily made a diagnosis of pregnancy complicated by a fibroid tumor. The patient was sent to a private sanatorium. On the evening of November 1 she miscarried of a fetus of about three and a half months, the placenta, being retained. Immediately following this, without any marked loss of blood, the patient went into collapse, the pulse

became thready and rapid, and the countenance very pale. After vigorous hypodermic stimulation the patient rallied in about three hours. The uterus was packed with iodoform gauze to prevent hemorrhage. Fourteen hours after the expulsion of the fetus, a well-known gynecologist removed the placenta under narcosis. There was no remission of the symptoms of collapse following this. November 3, two days later, she had chilly sensations and temperature 102 to 103° F., and from this date until the time of his visit the temperature ranged from 102 to 105° F. and the pulse from 100 to 120. On the morning of November 11, the temperature reached 106.4 and the pulse 130. When Dr. Vineberg saw her she looked deeply septic, was somewhat apathetic, her tongue was heavily coated and she had a pulse of 150, temperature 105, and respirations 60. The uterus was found to reach to the umbilicus; the cervix was open and the finger could detect a soft mushy mass in the uterus which gave off a very fetid odor. The diagnosis was made of a submucous fibroid growth which had become infected. In view of the incident, symptoms of apparent collapse, following the abortion, it was deemed that surgical intervention would be too dangerous and probably would be attended with death on the operating-table, although it was admitted that the patient had no chance to recover without operation. Dr. Vineberg, however, was willing to assume the responsibility of performing a hysterectomy. This was done at the Mount Sinai Hospital. The operation offered no technical difficulties; taking about forty minutes. It was striking to note the difference in the patient's appearance the next day. She had a smiling countenance, her mind was perfectly clear, her temperature was 101, and her pulse 110. Her convalescence was complicated with a breaking-down of the wound and a phlebitis of the left leg.

The case offered certain points of interest: (1) the youthful age of the patient with so large a fibroid growth; (2) the absence of hemorrhage, although the growth was principally submucous; (3) the occurrence of pregnancy in the presence of a fibroid growth in that location.

This case further emphasized in a striking manner the observation that deeply septic patients with a temperature of 106° F. and over and a pulse from 130 to 160 would withstand a hysterectomy, provided it was expeditiously done and without undue loss of blood, with less shock than would occur in a nonseptic woman.

Touching the question of pregnancy complicating fibroid growths of the uterus, he referred to two cases recently operated upon by Dr. Krug at the Mount Sinai Hospital. One of these patients was thirty-four years of age, a primipara; eleven days before admission she was delivered of a premature still-born fetus at about seven and a half months. The uterus reached to the umbilicus and above. There was a moderate fever. The pulse was from 80 to 90. Her general condition was good. At

operation there was disclosed a submucous fibroid, the size of a cocoanut which was undergoing sloughing. The patient made an uneventful recovery.

In the second case, the patient, a nullipara, was twenty-eight years old, had been married eight months and was admitted to the hospital for an incomplete abortion, at about the seventh week of pregnancy. It was discovered that she had a fibroid growth the size of the fetal head. She was first cureted and some days later a hysterectomy was performed. This growth also was of the submucous variety. She made a satisfactory recovery. In both of these patients there had been no prior menstrual disturbances.

DR. L. J. LADINSKI reported four cases:

I. ECLAMPSIA COMPLICATING DELIVERY OF MONSTROSITY.

The patient was twenty-seven years of age and had never been pregnant. She had been married two years. On admission to Beth Israel Hospital her general condition was good and also her development and nourishment. She had no edema, cyanosis nor dyspnea. The abdomen showed no rigidity nor masses but slight tenderness and resistance in the iliac region. The urine was negative on repeated examinations. The diagnosis made was bilateral diseased adnexa, anteflexion and stenosis. At operation the left ovary was found enlarged and cystic. The tube was congested. The right ovary and tube were adherent and the fimbriated extremity closed. Adhesions were broken up and the phimosis operation performed on the fimbriated extremity. The appendix was found chronically inflamed, with a few adhesions, and was removed in the usual manner and the abdomen closed in layers as usual. Discission, dilatation and curetage were then done. About two years later the patient returned to this city pregnant about three months. Her expected delivery was to have occurred about November 11, 1911. The progress of her pregnancy was normal and uncomplicated up to September 18, when the membranes ruptured without premonitory sign and a large quantity of amniotic fluid escaped. There were no labor pains whatever. Examination revealed the os dilated to the size of a dollar and the head presenting. Palpation of the abdomen strongly suggested twin pregnancy. The patient made satisfactory progress for an hour when she began to complain of dimness of vision. A specimen of urine examined at this time was negative as to albumin, sugar and acetone, and contained only a very few cylindroids. Rapid delivery was decided upon, and was effected by high forceps. Shortly after delivery (about 2 P. M.) the patient had several convulsive attacks, but under stimulation with strychnine and nitroglycerine the convulsions ceased and the pulse, respiration and sight improved. About 8 P. M. she was again seized with convulsions and in spite of nitroglycerine, venesection, etc., she did not rally but died at about 12 P. M. This case presented the

interesting question as to what part, if any, the gestation with the monster played as a causative factor in the eclampsia, especially as the patient showed no affection of the kidneys or any other organs previously. The fetus was a monster of the hemipagus symphysosopus variety and will be reported in full later.

II. RUPTURE OF THE UTERUS DURING PARTURITION.

The patient, thirty-two years of age, had had four normal pregnancies, the last child having been born four years ago. Her fifth pregnancy was normal and came on at full term. The presentation was transverse and the hand presented in the vagina. After performing podalic version the after-coming head was extracted with great difficulty. On the third day after her delivery the writer saw the patient in her home, when her pulse was 130 and temperature from 103 to 105. The abdomen was greatly distended and tympanic and the uterus was occupied by a large hard tumor extending above the umbilicus, especially on the right side. Vaginal examination revealed a large fibroid uterus. The os was patulous and the cervix intact. The finger introduced through the external os showed a rent in the left border of the uterine wall, just above the cervix, which communicated with a large cavity caused by the separation of the layers of the broad ligament on that side; the rupture was apparently subperitoneal. The uterine cavity as well as the rent were filled with foul-smelling débris. The patient was advised to subject herself to a hysterectomy as giving a possible chance for life. She refused to go to the hospital and the usual palliative measures were applied at the home of the patient. The following day her condition became much worse and she was transferred to the hospital and a laparotomy was done. The uterus was very pale, enlarged to the extent of a four months' pregnancy and studded with a number of small fibroids. The lower uterine segment on the left side including the entire broad ligament extending beyond the infundibulum was discolored, edematous, swollen and necrotic in parts. The left ovarian veins were very much distended and thrombosed. On pressure foul-smelling pus exuded from the left broad ligament into the peritoneal cavity. Hysterectomy was done and on removing the uterus it was noticed that there had occurred a subperitoneal rupture, separating the cervix from the body of the uterus posteriorly and on the left side, the rupture involving a great portion of the left border of the body of the uterus, and separating completely the two layers of left broad ligament. The cavity thus produced in the broad ligament was filled with blood, foul-smelling pus and necrotic débris. In the anterior wall of the cervix, immediately above the rupture, was a fibroid the size of an egg. The stump of the cervix was removed separately and two drains were inserted into the vagina from above; one in the left pelvis and one in the right. The patient rallied after an infusion but sank later and died that evening. This case was in-

teresting because of the impediment to labor caused by a comparatively small fibroid, because of its situation in the anterior wall of the cervix. The rupture was unavoidable and might have occurred in the most skilled hands. The only measure that might have saved the patient's life was an abdominal Cesarean section, which the attending physician could not consider under the circumstances.

III. CESAREAN SECTION. ILEUS, ENTEROTOMY, RECOVERY.

A woman twenty-eight years of age had had one miscarriage at the fourth month. She was diminutive, poorly nourished, and with a markedly kyphoscoliotic pelvis. From December 24, the day of her admission, to December 27, the patient continued to have ineffectual pains. During the night of December 27, the pains became severe and frequent and at 2 P. M. a Cesarean section was done under ether, a live child extracted, and the patient returned to bed in good condition. The pulse remained at about 90 for two days and then began to increase in rapidity until the sixth day when it was 130 to 140. Nausea and vomiting started in on the third day after section and continued at frequent intervals. The vomitus was never fecal. The abdomen became markedly distended and there were cramps. These symptoms continued in spite of medication, lavage and enemata. No effectual bowel movement was obtained though flatus was expelled from time to time. On January 3, the patient's condition becoming grave, it was decided to explore the abdominal cavity. The intestines were found markedly distended but slightly injected and a small amount of bloody serum was present in the cavity of the abdomen. A small portion of ileum was found covered with lymph and slightly constricted. The portion above the constriction was withdrawn, incised, and a glass tube with rubber connecting tube tied in through which gas and feces were expressed until distention diminished. A rubber tissue drain was inserted in the pelvis and the wound partly closed. Saline infusion was administered and the patient returned to bed. Shortly after the enterotomy the bowels moved satisfactorily and gave no further trouble. Forty-eight hours afterward the glass tube and drains were removed and the wound closed. Recovery from this time was uneventful. He had been unable to assign a cause for the ileus except the low vitality of the patient and the peculiar contour of the abdominal cavity, and possibly the morphine administered for several days previous to the section.

IV. CARCINOMA OF THE CLITORIS, WITH METASTASES IN THE GLANDS OF BOTH INGUINAL REGIONS.

The patient was a multipara, fifty-eight years of age, whose last child was born eighteen years ago. Her menstrual history was negative and the menopause had occurred twelve years ago. About six months before consulting a physician she had noticed

a small tumor the size of a pea in the region of the prepuce which had gradually increased in size and caused annoyance and pain. She was a well-nourished woman showing no signs of cachexia and complained of no other ailment except a bleeding and painful tumor in the introitus vagina. Both inguinal regions were the seat of large, hard, slightly tender glands. Those of the right side were the size of walnuts. A cauliflower-like growth, circular in shape, was occupying the region of the clitoris and was connected by a broad pedicle to the upper third of the right labium majus. A secondary metastatic nodule was seen on the inner surface of the right labium about 1 1/2 inches below the original tumor. At operation the carcinomatous mass, including the vulva, was removed. The inguinal glands, particularly of the right side were enlarged and adherent. An incision on the right side, parallel to Poupart's ligament, extending from the anterior inferior spine to the labium majus was made; the glands and fat dissected free but not removed. A circular incision was then made an inch from the base of the pedicle, the incision embracing the mons veneris above, the labia on either side, and the vestibule to within a quarter of an inch of the upper border of the meatus, and the tumor, clitoris, skin and fat dissected free; the inguinal glands and tumor were then removed en masse. A perforated rubber drainage tube was inserted in the lower angle of the wound and the entire wound closed with Pagenstecher linen. The left inguinal glands were next removed by making small incisions over these glands; several small glands were excised. Numerous small lipomata were found, but were left intact. The tumor of the labium proved to be a melanotic carcinoma. It corresponded pathologically to the type of new growth previously termed melanotic sarcoma, which was now regarded as epithelial in origin. In all probability the tumor arose in a pigmented mole.

DISCUSSION.

DR. BROOKS H. WELLS, in speaking of the last case, looked upon chronic papillary lesions at the mucocutaneous junction as being often forerunners of carcinoma and he believed that they should, in all cases, be removed. He had seen two instances of carcinoma which had developed from these papillomata.

DR. FRANKLIN A. DORMAN said it was hard to explain just why eclampsia should occur so often with monstrosities. They knew that in cases of twin pregnancies there was an increased liability to eclampsia as the strain on metabolism was greater than in ordinary pregnancies. In a large number of instances eclampsia occurred without giving them the least warning of what was to happen. The kidney excretions showed nothing.

A PRELIMINARY REPORT ON A NEW ANTISERUM FOR CANCER.

DR. WILLIAM N. BERKELEY and DR. S. P. BEEBE read this paper in which they described the work done at the Huntington

Cancer Research Institute with a physiological antibody, developed in an alien species by successive injections of a cancer extract. The proposition of an antibody was not a new one. The range of experiments at the institute had been large. They had used various animals, many different tumors, a large variety of biochemical products, single and in combination, as injections, and had also experimented with dosage within wide limits. Human neoplasms had been used exclusively, a procedure which had added interest to the investigation but had greatly increased its difficulty. What had been accomplished in the preparation of the cancer extract might be briefly stated as follows: 1. By successive injections of a specific human cancer extract, the cancer having been partially removed by operation, into an alien mammalian species it appeared that a serum might be developed which, when injected intramuscularly, or better, intravenously, in increasing doses into the original host, was followed by rapid regression and disappearance of the remains of the tumor. This could not be done with a normal alien serum. It was hard to explain the phenomenon except as a cytotoxicity of the tumor cells. 2. There was a strictly quantitative relation between the amount of serum used and the amount of tumor which might be made to disappear. 3. No ill effects had been so far observed from the injections of the serum in the sixteen cases upon which it had been used, except local swelling and the anaphylactic fever and vaso-motor disturbances noted after giving an equal amount of normal foreign serum. 4. The relation of one stock serum to histologically different cancers was variable and full of surprises. It would take years of labor to determine all the curious chemical affinities that might be involved. 5. Present clinical results were briefly as follows: Sixteen cases of malignant disease in all the stages of advancement had been treated in the last nine months by those interested in this research. A microscopical examination was made in all but three cases; fifteen were cancer and one was sarcoma. Nine received stock serum, one received autogenous serum after a secondary operation and six received autogenous serum after a primary operation. Of the nine patients receiving stock serum two were moribund when first seen and died uninfluenced by the injections; one having cancer of the esophagus was markedly benefited for a few weeks; one with an immense cancer of the tonsil was somewhat benefited temporarily. One very extensive cancer of the bladder had not recently been heard from but was probably not benefited. Of two immense cancers of the stomach one was entirely unaffected, and one was slightly improved. One patient having cancer of the breast, after two months of injections, was nearly well and in excellent general condition. A case of uterine cancer recurrent in the bladder recovered promptly and had remained entirely well for four months. One advanced case of cancer of the breast receiving a small amount of autogenous serum, after a secondary operation, was greatly improved, but subsequently died of acute

intercurrent disease. Of the patients receiving autogenous serum after primary operation one was still under treatment, greatly improved; the others had had no recurrence within a period ranging from three to six months. It was the present impression of the writers that the autogenous serum was much more effective than stock serum. It was believed that the great field of usefulness of this new serum would be the prevention of the recurrence of malignant tumors removable in the early stages by operation. There was no indication that large inoperable cancers and sarcomas would be amenable to the serum treatment. Treatment to be effective, must be early so that there might be a reasonable quantitative relation between tumor and antibody. The cases thus far treated were too few to justify sweeping claims for the future and this paper had been presented in order to clear up many misapprehensions in regard to the serum treatment of cancer.

CLINICAL ACCOUNT OF THIRTEEN CASES OF MALIGNANT DISEASE
TREATED WITH A NEW ANTISERUM.

DR. WILLIAM M. FORD read this paper, the purpose of which was to offer for consideration some clinical observations in regard to the use of an antiserum for cancer prepared by Dr. Berkeley. This remedy had been administered in thirteen cases. Of these Cases I and II which were cases of cancer of the breast and stomach respectively were in extremis before the remedy was administered and died within a few days after initial injection. Cases III and IV, one having cancer of the stomach and the other cancer of the throat took the remedy irregularly and expressed themselves as having been benefited. Case V, cancer of the bladder, seemed to be of the contrary opinion. There was nothing definite in any of these cases and hence they were dismissed from further consideration. In Case VI, a clinical diagnosis of cancer of the bladder having been made, a large amount of the serum was used without benefit; after operation the growth proved to be nonmalignant. In Case VII, in which only a clinical diagnosis of carcinoma of the esophagus had been made, the patient after an apparent improvement ultimately succumbed. Cases VIII, IX, and X each had autogenous injections after primary operation and as yet none had shown evidences of recurrence; however, the operations were done at such a recent date, three to six months ago, that nothing could be claimed in these cases. Case XI was that of a woman forty-two years of age and single and who had been operated on in November, 1908, for carcinoma of the left breast, as verified by Dr. Harlow Brooks. In September, 1910, she presented herself on account of pain and thickening of the tissues around the scar; this proved to be a recurrence of the carcinoma. From February, 1911, to May, 1911, the patient was given minute doses of stock serum subcutaneously at relatively long intervals, the dose being 0.5 to 1 c.c. It was found that the right breast

consisted almost entirely of what subsequently proved to be carcinoma. The axillary glands on this side were markedly enlarged, one mass being about the size of a walnut. On the left side the disease had descended in the lymphatics of the skin as low as the umbilicus and as high as the clavicle, the intervening triangle being studded with a vast number of pea-like masses distributed along the course of the lymphatics. In addition there were numerous areas of wart-like growths on the site formerly occupied by the breast. The patient was greatly emaciated, had a persistent cough and suffered continually from pain at the site of the old scar so that about a grain of morphine was administered daily. A rapid amputation of the remaining breast was done on May 2, and an autogenous serum was prepared. The autogenous serum was injected subcutaneously and intravenously between June 16 and July 31, 1911. The wart-like carcinomas shrank materially and the purple pea-like indurations diminished perceptibly, many of them entirely disappearing. The axillary glands on the right side resolved to such a degree that they were little more than palpable. The patient was then sent to the country to recuperate and it was not until September 29, that the serum treatment was resumed. It was then thought advisable to use the stock serum. From this time on the patient began to lose in weight, and her pleural cavity filled with serum from time to time. The fluid removed was perfectly clear amber, however, and at no time contained any suggestion of blood. Injections were only given once in ten days as the supply of serum was inadequate. In January the patient suddenly ran a high temperature, 103° F., her respirations rose to 48 and she died within forty-eight hours. No autopsy could be obtained but inspection of the breast disclosed an utter absence of the cauliflower growths and but a few small shot-like masses could be palpated. Not more than two or three were discernible to the eye.

Case XII, an unmarried woman, fifty-three years of age, was admitted to the Woman's Hospital in November, 1911. She had been operated upon in March, 1899, for a growth in the left breast which was said at that time to be nonmalignant. In September, 1910, eleven years afterward, she noticed a red spot the size of a quarter near the old scar and in September, 1911, ulceration began and the patient applied for relief in November. The ulcer on the site of the old scar measured $2\frac{5}{8}$ by 2 inches and was covered with necrotic tissue. Over the cartilage of the third rib, near the serum was a tumor the size of a walnut, intimately adherent to the underlying hard structures. At the lower margin of the ulcer was a similar tumor, and to the outside a third of nearly the same size. Between November 23 and December 12 she received two injections weekly of the stock serum and at the end of that time the greatest dimensions of the ulcer were $1\frac{1}{2}$ by $1\frac{7}{8}$ inches. Treatment was continued until January 22, when the ulcer had

entirely healed. On January 30, a slight ulceration had appeared on the surface of the larger of the two tumors. Since that time it had scabbed over and all the tumors had decreased in size. The patient had slowly increased in weight. A specimen removed on January 8, proved to be unquestionably carcinoma.

Case XIII was admitted to the Woman's Hospital on August 10, 1911. She was fifty-two years of age. Her menstruation had ceased seven years previously. She was married at eighteen years of age. She contracted a disease from her husband which resulted in cord sclerosis and this had remained stationary for the past thirty years. She had had uterine hemorrhages during the past year and a half and had lost 20 pounds during the past year. Lately she had incontinence and painful micturition. The local and constitutional measures for the relief of the vesical irritation had been without avail, and the patient suffered almost continually from bladder tenesmus. The Wassermann reaction was negative. A clinical diagnosis of cancer of the uterus having been made, a panhysterectomy was done on August 30. The condition of her bladder had not improved up to September 7, although she had made a good recovery from the operation. She was then referred to a cystoscopist, Dr. Osgood, who reported: "Base of bladder shows extensive bullous edema with one edematous, bluish mass, evidently in the grip of the internal vesical sphincter. Base of the bladder, per vaginam, feels thick. Diagnosis, carcinoma of floor of bladder." Upon the strength of this opinion, 5 c.c. of stock serum prepared from a breast cancer was injected subcutaneously September 20, and, to their surprise the relief was almost immediate. On October 3, the patient having been relieved from all symptoms from about the time of her first injection, was referred to the cystoscopist, all information as to the administration of the serum purposely being withheld until his observations had been recorded. He reported as follows: "Bullous edema has disappeared. Internal vesical sphincter is nearly of normal appearance. Base of bladder, per vaginam, no longer feels thickened. Bladder shows moderate subacute cystitis and vesical outlet shows a slight degree of edema and redness. The case is, therefore, to be looked upon as not carcinoma of the bladder, as stated previously." The patient left the hospital on October 12, 1911, feeling quite restored to health, had gained in weight and stated that her general condition was better than it had been in years.

A STUDY OF THE INTEGRITY OF THE UTERINE SCAR AFTER CESAREAN SECTION.*

DR. J. A. HARRAR presented this paper.

*For original article, see page 808.

REVIEW.

MANUAL OF OPERATIVE SURGERY. By JOHN FAIRBAIRNE BINNIE, A. M., C. M. (Aberdeen). Surgeon to the General Hospital, Kansas City, Mo.; Fellow of the American Surgical Association; Membre de la societe internationale de chirurgie. Fifth Edition, revised and enlarged. pp. 1153, octavo. With 1365 illustrations, some in colors. Philadelphia: P. Blakiston's Son & Co., 1912. Price, \$7.00, net.

While we will miss the little book in its fine, thin paper and flexible covers that represented the first editions of Binnie's now justly admired operative surgery, we welcome its larger successor which represents in one the fifth edition of Vol. I and the second edition of Vol. II.

The author has gone over his work carefully to bring it up to date, so that it will continue to maintain its favor with surgeons. The plan of the work has not been changed. It omits all of theory and of literature and of other matter usually sufficiently described in ordinary text-books, and includes much ordinarily omitted. It is purely a practical manual of operative technic. The text is clear and incisive; full in detail and yet concise; and in all respects satisfactory. We know of no book that can take its place.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

The Sweat Glands in Puerperal Infection.—Stefano Rebaudi (*Folia Gyn.*, vol. vi, Fasc. 11, 1911), from the study of the sweat glands in women who have died from some form of puerperal infection, finds that there are considerable alterations of these glands, which have taken part in the attempt made by all the organs of the body to rid the organism of the poisons produced in this state. The kidneys and liver show marked degenerative changes, and similar changes are found in the sweat glands. The examination of skin taken from the axillæ immediately after death in such cases has shown that there is a functional hyperemia of the sweat glands, which is intensified into acute parenchymatous degeneration, from vacuolization to granular degeneration, nuclear alterations, necrobiosis, and epithelial desquamation. In different cases it is found that the lesions are the same in the kind, differing only in degree with the nature and severity of the accompanying infection. These changes

occur not only in genital sepsis, but also in other puerperal manifestations of sepsis such as bronchopulmonitis. The predisposing cause of these changes is the puerperal condition, the contributing causes are the different kinds of toxins produced in the system as a result of the presence of the fetus in the uterus, combined with increased activity of the generally saprophytic bacteria. The attempt to eliminate these poisons undertaken by the sweat glands, as by the liver and kidneys causes their degeneration. The gravity of the lesions of the sweat glands is parallel with those of the kidneys in the same cases. Fatty degeneration and desquamation of the epithelia of the glands is most often seen.

Hypophyseal Medication in Obstetrics.—J. Parisot and A. Spire (*Ann. de Gyn. et d'Obst.*, Dec., 1911) state that the remarkable properties of the extract of the hypophysis, affecting the muscular system, the vessels, heart and kidneys, have been utilized in cardiovascular troubles, myocarditis, acute and chronic infections, nephritis, etc. It is now being used in obstetrics on account of its power of exciting to contraction the unstripped muscle fibers. It also acts on the bladder, causing contraction. After studying the reports of various experimenters who had made use of this medication at various stages of labor and the puerperal state, they undertook its use in their own cases. According to enthusiastic experimenters it caused a rapid increase in the muscular contractions of the uterus, assisted in hastening delivery, and in cases in which there was inability to pass urine after labor, it caused spontaneous evacuation of the bladder. They never at any time, observed any bad consequences after the use of pituitrin. In four cases of labor they observed in three an increase of the intensity and frequency of the uterine contractions. In two abortions the medication did not hasten the delivery of the fetus. Of four cases where it was used to cause micturition, in three spontaneous passage of urine occurred. In these cases the extract of the entire gland was used, while in those of other experimenters who have had better results, the extract of the posterior portion of the gland alone was employed, and the difference in results may be due to this fact, since the extract of the posterior portion seems to be more active than that of the whole gland.

Results of Use of Salvarsan in Obstetrics.—Cyrille Jeannin (*La Presse méd.*, Jan. 6, 1912) says that in the pregnant woman syphilis is grave, the symptoms are multiple and severe. When treated by salvarsan the action of the drug is the same as in the nonpregnant state, that is, a rapid improvement takes place. The author advocates three injections, at intervals of eight days, the first intravenous, the others intramuscular. This method of treatment has no more dangers than the mercurial treatment. The drug has no bad effect on the continuance of labor. The fetus generally goes on developing as if nothing had been done and some effect is seen on the syphilitic symptoms at birth.

The writer believes that the only logical method of treating the child is by the intramuscular injection. Treating the mother in the hope of affecting the child through her milk is futile.

Wassermann Reaction in the Blood of the Umbilical Cord, the Maternal Blood, and the Blood of the Fetus after Birth.—Alberto Ferro and Attitio Gentili (*Ann. di Ostet. e. Gin.*, Dec., 1911) base their estimate of the value of the Wassermann reaction in the fetus and mother immediately after birth on their tests made in pregnant women during the last two years, immediately after labor and at various phases of the puerperium. It is interesting to compare the results of this test in pregnancy, labor, and the puerperium in women who certainly have syphilis, who are suspected of it, in normal women, and in other complications of pregnancy. These syphilitic women may be divided into those who have been treated and those who have not been treated for syphilis. The number of syphilitic women was twenty-three out of 110 tested; the Wassermann reaction was positive in seventeen, either in the blood of the mother or of the umbilical cord. It was positive in all of the mothers who were in the florid stage of syphilis, and diminishes in positiveness according as the manifestations of active secondary syphilis are long ago shown. Mercurial treatment has the same action in pregnant women as in other women. This reaction is also positive in eclampsia and malaria in the pregnant woman. It is always absent in normal pregnancy and that accompanied by complicating diseases except malaria and eclampsia. It is found that the Wassermann reaction is positive in syphilitic fetuses fifty to 120 days before specific manifestations appear; the reaction is at first partial only; this reaction may be absent if treatment has been undertaken energetically; the placenta of a woman who has given birth to a syphilitic fetus may be perfectly normal; in the macerated fetus the placenta shows flattening of the villi and lessened intervillous spaces; there are vascular lesions, but no formative processes are shown in the epithelium covering the villi; the membranes are not changed; the organisms are found in the fetal portion of the placenta. Macerated fetuses may be found in women who have absolutely no evidence of syphilis; the reaction is positive in the cerebrospinal fluid of fetuses born of syphilitic mothers, and also in that of fetuses which have died of syphilis soon after birth; it is present in the cerebrospinal fluid of those born heredosyphilitic in mothers who do not give the reaction in their blood or that of the umbilical vein; this reaction in the macerated fetus alone is sufficient to cause a diagnosis of syphilis; it is negative when death and maceration arise from other causes; but this negative evidence is not sufficient to entirely exclude syphilis.

Extraperitoneal Cesarean Section.—E. Ferroni (*Annali di Ostet. e Gin.*, Jan., 1911) derives his opinion of the value of the extraperitoneal Cesarean section from eleven cases operated upon by him. The lessened danger of the operation arises as

much from the difficulty of development of germs in the tissues as from the lessened intensity of the process. It has been demonstrated that the connective tissues are susceptible to infection as well as the peritoneum, and it may even cause the death of the patient. The sterility of the genital passages cannot represent the only or the most important element in the indications for the extraperitoneal section. In this operation all the functions of the body remain normal and are carried on as usual; feeding, and the use of purgatives, go on as in the normal patient. The bladder is generally not interfered with. The author has seen no unpleasant symptoms in any of his cases; and the remote results have been good. Hernia and adhesions, which may occur in the classical Cesarean section, are unknown in this form.

Treatment of Acute Peritonitis in the Puerperal State.—André Boquel (*Arch. mens. d'Obstet et Gyn.*, Jan., 1912) says that the treatment of peritonitis in puerperal women to-day is the removal of the cause early in the course of the disease whenever possible. This generally requires a hysterectomy. Peritonitis has been cured in such cases by opening the cavity without removal of the offending organ. These cases of peritonitis generally result from an appendicitis or the rupture of a pyosalpinx; pregnancy does not influence the required treatment. As soon as the diagnosis is made a laparotomy should be done. The author has collected twenty-three cases of peritonitis after delivery or abortion. Of these, twelve were operated on, eleven were not; of the latter, five were cured, four died. Four cases operated on after abortion were cured. In five cases the appearances of peritonitis were not shown after operation, and all of these recovered promptly. The signs of diffuse peritonitis are not always certain. Death resulted when operation was neglected on account of a failure to diagnosticate the condition; on the other hand in cases in which peritonitis did not exist the operation had no bad consequences. Peritoneal manifestations in the course of labor are not exceptional and laparotomy is often the only possible method of treatment.

The Toxicity of the Urine and Serum of Eclampsics.—P. Esch (*Münchener medizinische Wochenschrift*, Feb. 27, 1912) calls attention to his previous experiments in which he showed that the intracardial injection of neutralized urine from both pregnant and nonpregnant women did not produce any well-marked symptoms in the injected animals. On the other hand, the injection of the urine from patients later in the puerperium seemed to exert distinct toxic symptoms resembling those of anaphylactic shock. In none of these animals however, was the shock either severe or fatal. In a more recent series of experiments the same investigator has employed urine, serum, and liquor amnii from two cases of eclampsia, as the result of which he claims that the urine and serum have a well-marked toxic action. This is manifested in guinea pigs after intracardial injection, by anaphylactic shock, and the autopsies made on the animals subsequently

showed the characteristic lesions of this condition. The liquor amnii on the other hand was found to be free from any toxic action. During the puerperium, the toxic effects referred to, disappeared rapidly. Esch believes that the toxin in the serum is identical with that in the urine. The latter seems to be independent of the specific gravity, the degree of acidity or the contained albumin. An insufficient number of cases having been examined, the writer's conclusions are presented with certain reservations. It would appear, however, that the toxin present in the urine cannot be eliminated by repeated boiling. Recovery from shock after the injection protects the guinea pig for several hours against reinjection of the toxic urine. An animal which manifests an antianaphylactic action towards the serum is not susceptible to the urinary toxin, while on the other hand, the serum anaphylaxis could not be reduced by means of the urinary toxin. It was also found that no toxic sequellæ followed the injection of toxic urine, combined with serum from the same patient. This was also observed if a mixture was injected consisting of equal parts of the toxic urine with the serum of a normal pregnant woman or that obtained from a nonpregnant individual. Esch also calls particular attention to the fact that the subcutaneous injection of 0.5 c.c. of the toxic urine in guinea pigs does not produce any local reaction, much less a necrosis. The writer is not prepared to discuss the relation of these toxins to the production of eclampsia, as an insufficient series of animal experiments have been made, but he claims that such phenomena seems to point to a destruction of the parental albuminoids. It must be assumed, however, that the excretion of this poison in the urine, (even if it is found identical with the anaphylactic toxin) is sufficient evidence of anaphylactic poisoning. The extensive damage to the parenchymatous organs associated with eclampsia may be the etiological factor in the production of the toxic substances in the urine and serum of these patients and Esch believes it is extremely doubtful that the latter is the cause of the degeneration.

The Etiological Significance of Fibrin Ferments in Pregnancy, Nephritis and Eclampsia.—A. Dienst (*Archiv für Gynaekologie*, vol. xcvi, No. 1, 1912) presents an additional series of experimental studies to further substantiate the theories which he has already proposed as explaining the etiology of certain toxemias of pregnancy. This observer believes that, as pregnancy uses up more than the normal number of leukocytes, the resulting thrombokinase floods the blood in such quantities that the symptoms ordinarily associated with the phenomena of eclampsia will follow. The scope of the author's work is evident from the fact that over 125 pages are required to present the results of his experimental studies and their interpretation. The conclusions of this experimental study may be summarized as follows: The insufficient heart action which necessarily accompanies pregnancy results in circulatory disturbances in the excretory organs, which

interfere with the excretion of toxins and result in the consequent accumulation in the body of these substances, which consist mainly of fibrin ferments derived from the maternal blood-corpuscles. Primiparae and women with multiple fetuses are predisposed to pregnancy intoxications on account of the abundance of leukocytes and the increased quantity of the fibrin ferment and the fibrinogen produced by them, as well as the interference with the heart action due to increased intraabdominal pressure brought about by the growth of the pregnant uterus and the tension of the abdominal walls. Thus, as the result of an insufficient blood supply, a relative insufficiency of the excretory organs and their function will result. The presence of even small quantities of toxic substances will result in degenerative changes of the parenchymatous organs, which manifest themselves by albuminuria, edema and metabolic disturbances. When, as the result of the storage of increased quantities of these toxic materials, the concentration of the fibrin ferment is disturbed, then the general toxic symptoms result which are brought about by the increase in the formation of fibrin in the organism of the pregnant woman and the consequent rapidly changing cerebral pressure which results in convulsions. If this concentration of the fibrin ferment necessary to fibrin formation is not attained, then the accumulation of undue amounts of fibrinogen in the blood will lead simply to severe degenerative changes of the heart and excretory organs, ultimately producing a fatal issue without the formation of multiple thrombi or the production of convulsions. This may include necroses and fatty degenerations in the liver, severe renal degeneration with necrosis of the epithelium of the damaged urinary tubules and degenerative fatty changes of the heart muscle; that is to say those pregnancy intoxications of a severe degree which run their course without the production of convulsions.

In rare cases where the patient is otherwise normal, the mechanical pressure of the growing uterus on the large venous trunks of the pelvis may interfere with the discharge of the so-called prothrombin which is excreted by the placenta. In such instances large amounts of prothrombin and leukocytes may be stored up in the veins and lymphatic spaces of the entire lower portion of the body without the involvement of the excretory organs. When this congestion is relieved by the labor pains, large amounts of these substances find their way into the arterial blood which is rich in lime salts and are here suddenly converted into fibrin ferments. The inhibitory substances which are present only in normal amount are unable to combat the fibrin ferment which is thus suddenly thrown into the circulation and "eclampsia" results. Dienst claims that in most cases these two conditions are combined and that the patient who has developed symptoms of a pregnancy nephritis of slight degree is surprised by a sudden change in the process during labor or the

puerperium. In such cases autopsy findings in the liver and kidneys will be marked by the evidences of a previous pregnancy intoxication, rather than by the results of the later thrombosis and eclampsia.

Pituitrin for Interrupting an Overtime Pregnancy.—G. Hager (*Zentralblatt für Gynäkologie*, Feb. 24, 1912) refers to the employment of this remedy in cases where the pregnancy has apparently extended beyond the normal limits. In the case reported, two injections of 0.6 c.c. of pituitrin were given about seven hours apart and it was found that the pains became severe immediately after the injection of the second dose. In one and a quarter hours after the injection the child was born spontaneously, weighing 4225 grams.

The Absorption of Toxins from the Peritoneal Cavity.—O. Hoehne (*Zentralblatt für Gynäkologie*, March 2, 1912) refers to experiments which he has made regarding intraperitoneal injections of various irritant substances, such as croton oil, pulverized glass, etc., with the consequent result of increasing the resistance of the peritoneum itself against infections by highly virulent bacterial cultures. Another investigation was then undertaken for the purpose of determining whether protection could likewise be obtained against peritoneal intoxication. He used a series of rabbits for these experiments and found that although a prophylactic peritoneal exudate obtained by such means afforded a protection against peritoneal infection, it did not have any effect against peritoneal intoxication. This was shown by studying the effects of the injections of the toxins of diphtheria, ricin and crotein. One of the objects in making these experiments was to determine whether the peritoneum could not be employed for the absorption of narcotic substances including the intraperitoneal administration of ether, but the conclusions were negative.

Influence of the Ovaries on Respiratory Metabolism.—L. Zuntz (*Archiv für Gynäkologie*, vol. xcvi, No. 1) presents the result of researches in this subject, based on observations made in three women in whom the ovaries as the result of a gynecological process were involved to such an extent that they required removal. During the first few weeks after the castration, no diminution of the respiratory metabolism could be made out but this became very much more marked some time later. In two cases, relatively healthy ovaries were removed for the cure of osteomalacia, but here also the same change in respiratory metabolism was noted. No increase in this phenomenon could be obtained in any of these patients by the administration of oöphorin. The method for estimating the metabolic exchange included measuring the complete expired air during a stated period of time and then determining the oxygen and carbon dioxide content of an average sample of the same. From this the oxygen intake and the carbon dioxide production of the organism during a given period of time may be calculated, that is to

say, the degree of combustion resulting during absolute rest or what the writer designates as the "basic exchange."

A Contribution to Extragenital Infection in the Puerperium.—L. Nürnberger (*Zentralblatt für Gynäkologie*, Feb. 24, 1912) calls attention to the importance of diagnosing the source of infection from causes outside of the genital tract. In the case which is the basis of his remarks, a xvi-para, forty years of age, developed a severe case of puerperal sepsis in which it was found at autopsy that a phlebitis of the saphenous vein was present, which did not however result in a pyemic infection and did not involve the genitals. The writer presents a brief summary of the reported cases of the fatal extragenital infections, which includes the following: ulcers of the stomach and duodenum, appendicitis and tuberculosis, typhoid with intestinal perversion and various types of phlebitis, such as that mentioned in the author's case.

Early Symptom of Salpingitis.—W. Kuhl (*Münchener medizinische Wochenschrift*, February 20, 1912) calls attention to a symptom which may aid in the diagnosis of acute febrile pelvic conditions. This refers to the character of the pulse which is noticeably slow and full as compared with the rise of temperature. He has found this sign important in the differential diagnosis between salpingitis and perityphlitis. The sign has also been observed in the presence of biliary infections, but the localization of the pain in such cases will aid in the diagnosis. Kuhl believes that the slowing of the pulse may perhaps be accounted for by the absorption of something which influences the action of the vagus nerve. The writer also calls attention to a combination of this symptom with herpes labialis, which is assumed to be due to an infection with the bacillus coli communis.

Febrile Abortions.—E. Sachs, (*Zentralblatt für Gynäkologie*, February 17, 1912) calls attention to the necessity for carefully differentiating the various types of incomplete abortion accompanied by febrile symptoms, in deciding the form of treatment to be employed. If the septic process is localized outside of the uterus, a fatal result may follow with either the active or the expectant treatment, no matter what the infective organism. If the infection is limited to the uterus, however, a curettage is to be preferred to the expectant treatment unless hemolytic streptococci are present. If the latter can be demonstrated, the danger of curettage is greater than that which would accompany a waiting procedure and the writer therefore urges that such cases be kept absolutely quiet in bed until the febrile process and the streptococci have disappeared, which disappearance is often very rapid. Sachs believes that the cases referred to should be separated according to clinical and bacteriological points of view, and the hemolytic or nonhemolytic character of the infective organism considered.

Renal Decapsulation for Eclampsia.—E. Balzer, (*Monatschrift für Geburtshilfe und Gynäkologie*, March, 1912) after reporting three instances of renal decapsulation which ended

fatally, presents a study of the cases of this kind which have thus far been reported. There are three published cases of decapsulation done before labor, with one death, and ninety-one cases after labor with thirty-four deaths. The writer believes that the facts gained from a study of these cases is not very favorable to the adoption of the method in the treatment of eclampsia, as compared with other and less radical procedures. The theoretical indications for the operation do not seem to have been sufficiently well established and the results thus far are very uncertain. The later results, even in the cases that have recovered are also insufficiently known, but judging from experiments made in animals, the newly formed renal capsule is usually denser than the old one. This fact has also been established in a case of chronic nephritis which later came to autopsy. Only two cases are known in which a subsequent pregnancy was undisturbed where a previous decapsulation had been done. Balzer does not consider that in view of these things, the method is worthy of general adoption, because such procedures as that advocated by Stroganoff have resulted in reducing the mortality to 6.6 per cent. in a series of 360 cases, or about four times as many as the published cases of decapsulation. Moreover, by such procedures, pregnancy need not always be interrupted, whereas in the others, this is usually rendered necessary.

GYNECOLOGY AND ABDOMINAL SURGERY.

Cure of Several Inoperable Carcinomata by the Use of Antimeristem.—Otto Schmidt (*Zent. f. Gyn.*, Dec. 23, 1911) says that a number of cases of inoperable carcinoma have been treated with the new vaccine called antimeristem, with good results. This vaccine should in no way take the place of a radical operation whenever that is possible, but since one never knows whether all of the growth has been removed, antimeristem, which is quite harmless, may always be used to assure against recurrence. The author gives the histories of three cases treated by this measure with success. In the first, a case of cervical cancer, the operation was first performed, but there were carcinomatous portions of the parametrium that could not be removed. Under the use of antimeristem all these disappeared and two years later the patient still remained in good health. The second case was also one of inoperable carcinoma of the cervix uteri. Here also the carcinomatous tissue was removed as far as possible and the antimeristem was injected, with a like result after one year of observation. In the third case all signs of the cancer had disappeared when treatment ceased. These cases show that one should first attempt to remove all cancerous tissue, disinfect the site as far as possible and keep it drained and disinfected while making use of the vaccine. By so doing we may prevent recurrence at least for some months or years in an otherwise incurable case.

Fibrous and Myomatous Tumors of the Tubes.—Auvray (*Arch. mens. d'Obst. et de Gyn.*, January, 1912) publishes an interesting case of fibroma of the Fallopian tube, with a long pedicle. He has collected twenty-eight cases of this form of growth. They are generally single, and unilateral, and may be subperitoneal, interstitial, or submucous. Subserous tumors develop in the folds of the broad ligament or in the general peritoneal cavity. They are often pediculated and the pedicle arises within the tube itself; this pedicle may become twisted. Exceptionally the growth forms a ring around the circumference of the tube. Fibromyomata are generally small; they arise from the muscular layers of the tubes, and consist of interlaced muscular and connective tissue fibers. The tubes themselves are generally diseased. It is impossible before operation to differentiate these tumors from fibroids of the uterus or ovary. Weight, pain, hemorrhage, compression of other organs, and reflex symptoms do not differ from those caused by similar tumors of other structures. They may be confused with any other tumor of the abdomen, the solid or liquid tumors of the ovaries or uterus. Adenomyomata of the tubes also occur. They consist of nodules of glandular tissue scattered through the walls of the tubes. Their pathogenesis is a much discussed subject; they may be considered to be of congenital origin, or to arise from the glands of the mucous membrane with added hyperplasia of the muscular tissues. They must be removed by salpingectomy combined or not with hysterectomy; in all reported cases recovery has been the result of operation.

Pathogenesis of Chlorosis.—Uberto Archangeli (*Riv. Ospedaliera*, Jan. 15, 1912) gives the following interpretation of the symptoms and pathogenesis of chlorosis: the theory that makes chlorosis an anemia of insufficient new formation of blood through weakness of the hematopoëtic organs primarily, or secondarily to ovarian insufficiency, is not completely in accordance with clinical facts and anatomopathological and experimental data. Anemia is a symptom of chlorosis, it is not the whole chlorosis, it includes many symptoms such as women experience before and during the menstrual period, that is symptoms of premenstrual intoxication. In some cases and at some periods there is exaggerated hemolysis. Chlorosis should be considered as the effect of an intoxication from the internal secretion of the corpus luteum, insufficiently eliminated by the uterus, through absence or irregularity of menstruation, or its excessive abundance. There are chlorotics with entire hyper- or hypoovarianism. Hypoplasia of the uterus has an important effect on the occurrence of this intoxication and because this depends on insufficient development of the ovaries, it depends on hypoplasia of the ovary. The effect of castration on animals varies with the age of the animals; in adults it does not produce anemia, in the young there is slight anemia. Iron improves not the anemia, but the other symptoms of the chlorosis; probably it counteracts the

intoxication. This theory will assist in explaining the occurrence of chlorosis in the spring, and in girls who come from the country to the city. This is due to the absolute change in food and hygiene, and the abnormal stimulation of the ovarian function.

Treatment of Prolapsus Uteri.—M. Potocki (*Ann. de Gyn. et d'Obst.*, January, 1912) gives, as the chief cause of prolapsus uteri, child-bearing. Cases in virgins are not regarded as of much importance. There are several factors connected with pregnancy, labor, and the puerperium that cause prolapsus uteri, aside from perineal tears. The relaxation and softening of the tissues tends to allow them to be dragged down during the early months of pregnancy. At the time of labor if delivery is attempted before dilatation is complete the presenting part tears the unrelaxed cervix and surrounding tissues. Also the anterior portion of the cervix may be pushed down before the head, and tear away from the vesical supports while the posterior lip tears away from the rectum. In order to prevent these occurrences the author advises pushing the soft parts upward between pains and retaining them during a pain, when they will slip up. In operative deliveries the author thinks it well to insure perfect dilatation of the cervix by the previous use of a rubber balloon, which reduces to a minimum the resistance of the soft parts. After delivery all tears should be repaired with deep stitches taking in the torn sphincter muscles, and the author thinks it unwise to allow the patient to be up before the third week, since the large, uninvolved uterus tends to prolapse. Pessaries are not only not harmful, but, when properly fitted, are of the greatest service in giving comfort and supporting the uterus when operation is refused.

Genital Hypernephroma in Women.—H. Alamartine and G. Maurizot (*Rev. de Gyn. et de Chir. abd.*, Jan., 1912) call attention to the frequency of the inclusion of tissue in the genital organs of the human female. Among these are neoplasms produced by aberrant suprarenal glands. The diagnosis of these tumors has been made only by the microscope up to the present time. The authors give histories of ten cases, one of which was personally observed, and the others described in literature. The suprarenals are derived from the celomic epithelium of the internal face of the mesonephron. Some of these cells become separated and displaced and form separate glands, intrarenal and extrarenal. There is a genital group included in the broad ligament near the tubes which forms accessory suprarenals. In the male they are rare. They are also found between the various peritoneal folds in the neighborhood of the pancreas and liver. Hypernephromata of the female genitals are very rare. They may be found in very young girls or in women between fifty and sixty years of age. These tumors are readily recognizable by the surgeon when the abdomen has been opened; they are enucleable but are malignant. The suprarenal nature of these tumors is demonstrated by their characteristic structure and the grouping of the cellular

elements around vasculo-connective tissue islands of stroma. The cytological peculiarities of the elements are also characteristic, especially the presence of fat in the cells. They can be diagnosed only after the abdomen has been opened. When these tumors are large they are accompanied by obesity; the circulatory disturbances induce secretion of the hormones of the suprarenal causing hypertension, and slowing of the heart.

An Early Symptom of Extrauterine Pregnancy.—A. Solowij (*Zentralblatt für Gynäkologie*, February, 1912) calls attention to a symptom which he believes is of value in those cases in which the usual evidences of an extrauterine pregnancy have not yet appeared. He states that the first thing to be noted in the pelvis in such cases is an irregular resistance elicited on examination of Douglas's pouch. This is to be felt on the side in which the abnormal pregnancy has occurred, is slightly painful and of a doughy consistency which gradually invades the Douglas' space itself. It is necessary to examine suspected cases repeatedly in order to be able to detect this resistance as soon as it appears. Solowij describes two cases in which this sign was present, that were subsequently operated and the diagnosis confirmed, in which the only thing to call attention to the possible existence of the extrauterine pregnancy was the slight irregular hemorrhage after a period of amenorrhea.

Vaginal Cesarean Section for Eclampsia.—Beckmann (*Monatsschrift für Geburtshilfe und Gynäkologie*, February, 1912) presents statistics of this operation as observed at one of the St. Petersburg hospitals. Comparing them with the results of other procedures as regards sepsis, he claims that this operation does not increase the danger of possible infection in eclampsia. The writer has studied his statistics with reference to the effect of rapid delivery on the mortality and the course of eclampsia and also as regards its effect on the children. In a series of 306 cases of eclampsia the maternal mortality during labor was reduced from 34 per cent. to 18 per cent. and in the cases in which postpartum convulsions resulted the mortality was reduced from 31 per cent. to 14 per cent. If the cases in which the fatal result was due to cerebral hemorrhage, sepsis or endocarditis are excluded, the mortality is reduced even below these figures. It is also shown in the paper that the mortality was lowest (10 per cent.), in the cases delivered spontaneously, although the author modifies this by stating that in these cases the first eclamptic seizure did not occur until late, that is, shortly before labor. He claims, therefore, that these must be regarded as light cases, whereas the ones in which the vaginal section was done were all severe and in the majority the cervix had not been taken up, nor had satisfactory dilatation occurred. Of the cases in which the vaginal section was done (forty-three) there were eight deaths, or a total mortality of 18 per cent. Beckmann believes that the low mortality among the children constitutes a very favorable argument for the operation, as the

total in forty-three cases in which the section was done, was only 11.6 per cent. Comparing this with the other means of delivery, the mortality in the forceps cases was 33 per cent., in version with extraction 71 per cent. and in spontaneous delivery 30 per cent. [By way of comment it may be noted that there were only twenty-four cases out of a possible sixty-seven in which the other methods of delivery were employed.]

A Cutaneous Reaction in Puerperal Sepsis.—Koehler (*Monatsschrift für Geburtshülfe und Gynäkologie*, February, 1912) describes an attempt to make an early diagnosis of puerperal sepsis by means of a vaccination procedure, analogous to what has been done by Von Pirquet in tuberculosis. In carrying out this test, he employed intracutaneous injections of various antigens, such as bacterial suspensions, bouillon cultures and filtrates of streptococci. The injections were made not only in cases in which a cultural demonstration of streptococci was obtained from the uterus and the blood, but also in other cases where the positive or negative result was controlled by subsequent bacteriological examinations. The reaction was usually noted within two or three hours after the injection and consisted of a slight swelling at the point of administration which became localized in the form of a well-marked wheal in about eight to ten hours. This phenomenon appeared in 25 cases in which streptococci were demonstrated in the blood. In the presence of localized septic processes limited to the uterus, the reaction either failed to appear, or else was only slightly marked. It was also found that the reaction was much weaker in severe cases than in the moderate ones and this led the author to attempt to apply the test as a prognostic measure. It was found in the unfavorable cases, that the reaction was very weak and in the fatal cases it did not appear at all, notwithstanding the positive findings of streptococci in the blood. These facts agree in the main with those observed in tuberculosis, and may be attributed to the inability of antibody formation. Koehler concludes that by means of an intracutaneous injection of streptococcic antigens in puerperal sepsis due to infection with streptococci, that a scant reaction may be obtained which is useful in both diagnosis and prognosis. The reaction is limited to those cases, however, in which the streptococci can be demonstrated in the blood and is absent in the unfavorable cases notwithstanding this finding.

Amenorrheal Insanity.—C. T. Ewart (*Proc. Roy. Soc. Med.*, 1912, v, Obst. and Gyn. Sect. 81) states that there is a form of insanity which is definitely due to suppression of the menses. It is the cause of the insanity. It can be recognized by the patient recovering within three months of the establishment of the menstrual flow. This point is so important that young cases who have apparently recovered should not be discharged until the menstrual function is firmly reestablished, for, unless this be the case, they will quickly relapse. It is of course possible that

in cases of amenorrhea which do not recover the cause may be the same, but the lesion is irreparable; still, one has to differentiate between the two types. In every case there is an hereditary history of some disease which gives to the patient an unstable nervous system, peculiarly susceptible to some toxin, and this the suppression of menstruation throws into the circulation. The writer suggests that in the fluid of the Graafian follicle and in the ovum itself lie hidden the secret of amenorrheal insanity. When this follicle is ripe it bulges, and on pricking it a fluid spurts out and is received into the Fallopian tube, which thus acts the part of a drainage-tube. It is possible that this fluid may not only facilitate the passage of the ovum, but also be the power which advises the uterus of the coming of a welcome guest. In amenorrhea there is no ripening and bursting of a Graafian follicle, but the ovum and fluid are absorbed as they are in childhood, and this being in excess of the physiological requirements, the whole organism becomes saturated, insanity appears, and the term "mental amenorrheics" may be applied to these cases. A similar sequence of events may be seen in the "mental alcoholics."

Prevention of Postoperative Gynecologic Psychoses. H. P. Cole (*Jour. A. M. A.*, 1912, lviii, 102) says that permanency of cure in gynecologic cases is frequently determined by the absence of postoperative psychic sequelæ. A judicious selection of time and place for the operation, the employment of a tactful nurse, a cool, quiet room, a short and comfortable preoperative hospital residence. A short visit from the operator shortly after the patient regains consciousness, a short visit from one or two tactful relatives on the first day usually suffice to keep the patient in a normal mental condition. Careful attention to the prevention or alleviation of postoperative pain, permitting free motion of limbs, latitude in change of posture, alcohol rubs or at most a mild sedative, will usually eliminate insomnia and thus the inception of far more serious nervous sequelæ. Elimination of morphin therapy and the early and frequent use of the rectal tube, together with early evacuation of the bowels remove tympanites as a serious etiologic factor of psychic complications. The substitution of a soft diet within a day or two after operation, and a rapid return to the establishment of the patient's normal preoperative diet and early institution of the back-rest and removal to a chair within a few days after operation continue the dissipation of the "invalid idea." An early removal to the home not only establishes a shorter and more comfortable convalescence but removes the patient from contaminating associations with other female patients.

Strangulated Femoral Hernia.—Following the rule of sexual frequency all nine of the cases referred to by John Douglas (*Jour. A. M. A.*, 1912, lviii, 172) are women. He says that because of the danger of strangulation and inability to cure by other than operative measures, operation should be advised when a diagnosis of femoral hernia is made. Sufficiently early diagnosis and

operation would prevent the necessity of intestinal resection, and thus lessen the mortality. Intractable vomiting with pain, either abdominal or localized in the groin, especially in women, should indicate careful examination of the femoral rings, even before it is obvious that intestinal obstruction exists. Operation should be performed as soon as the diagnosis of strangulated femoral hernia is made, if gentle attempts at reduction fail. If the strangulated intestine is damaged beyond viability, resection and anastomosis should be performed. When there is a sufficiently long mesentery not to hamper the operation, this may be done through the primary incision made over the femoral ring; otherwise, a secondary abdominal incision should be made. Except in the most desperate cases, when the patient's condition is so extremely bad that it is impossible to perform an anastomosis, an enterostomy, even as a temporary resort, should not be done.

Postoperative Mechanical Obstruction of the Intestine Occurring Soon After Operation.—Four cases of this type have been observed by A. M. Judd (*Long Island Med. Jour.*, 1912, vi, 9). He believes from the study of the symptomatology of these bowel obstruction cases, many go to their graves under the diagnosis of and treatment instituted for the condition called acute dilation of the stomach. There are three causes to be assigned for the condition. First, direct obstruction due to adhesions and kinking of the gut, a loop being adherent to an adjacent loop, to the parietal peritoneum, to one of the solid organs occupying the abdomen which has been abraded of its peritoneum either through handling or operative work, or to drainage gauze. Second, indirect obstruction through the omentum having formed adhesions and thereby pulling sufficiently upon the colon to cause kinking and obstruction. Third, paralysis. This latter cause is usually spoken of as nonmechanical, but the author feels that the paralysis of a muscle is a mechanical factor. Where the diagnosis between these, acute dilation of the stomach and obstruction of the bowels, is doubtful, he urges only a short trial of treatment directed toward dilation, *i.e.*, stomach washing, posture and the administration of eserine and strychnine and enemata, and then the relief of the probable adhesions by operative measures through the primary wound or the stasis of the paralytic form of the obstruction by enterotomy.

Genital Psychoses.—Lucien Picqué (*La Gyn.*, Jan., 1912) thinks that the doctrine recently announced by Bossi that puerperal and genital psychoses are always due to some form of infection from the genital organs, is hard to reconcile with the mental heredity of degeneration which has been generally accepted for some years. The author defends the extra-genital origin of psychoses. A long experience as gynecologist and alienist has convinced him that when the uterus contains elements capable of causing a reaction in the brain the partial or total extirpation of these will cause the psychosis to disappear. There are two classes of patients; first those in whom the cere-

bral trouble begins under the influence of a peripheral lesion which may be located in the uterus. In these patients are seen a kind of delirium, a species of affectivity, and certain forms of melancholia and hypochondriasis. In another set of cases are cerebral troubles in which visceral projection is especially involved. The peripheral affection is then independent, but there is a function symptomatology of impressions. In these cases any sort of operation aggravates the mental condition. It is an error in all cases of mental trouble to practise operations at once. Mental troubles occur in women whose genital organs are absolutely normal. There are also cases in which gynecological operations make the patients worse. Mental troubles from infection are generally transitory and mild.

Pathology and Treatment of Tuberculosis of the Bones and Joints.—H. J. Stiles (*Jour. A. M. A.*, 1912, lviii, 527) states that bone and joint tuberculosis is particularly common in Scotland, especially among the artisan and poorer classes. This prevalence is partly due to the system of living in old and crowded flats, but more especially to the presence of bovine tuberculosis in the dairy cows, to their inadequate inspection, and to the ignorance of the farmers and public generally regarding the transmission of bovine tuberculosis to the human subject. The chief portals by which the bacilli gain access into the human body are the buccal and pharyngeal tonsils, the lungs and the intestine, the bacilli being carried to the associated lymphatic glands and thence into the blood-stream. The localization of the disease in the bones is accounted for by the distribution of the intraossal vessels, and that in children the disease is more frequently met with in the growing ends of the diaphysis (the metaphysis) than in the epiphysis. The joints which are most often and earliest involved secondary to an osseous focus are those which possess small epiphyses, viz., those at the hip and elbow. In the rare instances in which the disease begins in an epiphysis, it does so more especially in those which are relatively large and which begin to ossify early, viz., those at the knee. The reason why primary bone foci are so much more frequently met with at the elbow than at the shoulder or wrist, is that the nutrient arteries of the humerus and bones of the forearm are all directed toward the elbow, and the same fact probably explains why a tuberculous focus is much more frequently met with in the upper than in the lower metaphysis of the femur. The frequency of tuberculous dactylitis is also accounted for by the blood-supply of the bones. Tuberculous diaphysitis of the long bones proper is probably commoner in children than has hitherto been supposed, and the condition has no doubt often been regarded as syphilitic or as due to a subacute pyogenic infection. A circumscribed focus of tubercle in the metaphysis should, if possible, be removed by operation before the adjacent joint becomes involved; this may be done either by gouging and curetting or by a subperiosteal resection. In the majority of

cases tuberculous diaphysitis should be treated by subperiosteal resection rather than by gouging and curetting, except perhaps in the case of the femur. If the metaphysis as well as more or less of the diaphysis is involved, and the affected portion of bone is divided and wrenched away from the epiphyseal cartilage, the latter does not come away with the diaphysis but always adheres to the epiphysis. If this operation be undertaken before the periosteum has become invaded by the disease, its bone-forming properties are such that it is capable of completely reproducing the portion of bone which has been removed. In the after-treatment it is advisable to apply extension to the leg in order to keep the periosteal tube on the stretch so that shortening and angular deformity may not occur. In order to obtain a stable weight-bearing leg after excision of the head and neck of the femur for tuberculous disease, the leg should be placed in the after-treatment in the abducted position with the trochanter planted firmly into the acetabulum, and the muscles stitched back over it. In excision of the knee for tuberculous disease, nailing of the tibia to the femur greatly facilitates after-treatment and at the same time insures osseous ankylosis in good position, and the same may be said of nailing the foot to the tibia after excision of the ankle. In excising the elbow for tuberculous disease in children, it is often necessary to combine the operation with subperiosteal resection of a considerable portion either of the humerus or of the bones of the forearm.

Normal Human Blood-serum Injections in Melena Neonatorum and Other Conditions.—Supplementing his original report made in 1910, J. E. Welch (*Therap. Gaz.*, Feb. 15, 1912) says that he has now used injections of normal human blood serum in thirty-two cases and believes it a specific. It seems to act by supplying blood plates and so favoring coagulation. In septic conditions normal human blood serum appears to have considerable value, as it does in cases of hemorrhage after operation on deeply jaundiced persons.

Membranous Rhinitis.—I. Forbes and H. P. Newsholme (*Lancet*, Feb. 3, 1912, p. 292) finds that membranous rhinitis can readily produce similar disease in others. The connection between membranous rhinitis and diphtheria in a school outbreak reported was so intimate as to make it almost certain that there was a causal relation between them. It is a point of practical importance that the comparatively frequent occurrence and great infectivity of membranous rhinitis should be recognized widely. Missed cases of the disease would readily account for a not inconsiderable proportion of school diphtheria. An autogenous vaccine seems to be of definite value in removing membrane, getting rid of nasal discharge, and hence greatly reducing the activity of membranous rhinitis. But the vaccine does not appear to be capable of completing the work of elimination after the membrane has gone—i.e., after the vascular and lymphatic channels by which antibodies can reach the bacilli have been removed.

Congenital Malignant Renal Tumors.—A study of the malignant renal tumors of congenital origin occurring in childhood, with a report of two cases by J. L. Bendell (*Albany Med. Ann.*, 1912, xxxiii, 136) shows that the so-called kidney sarcoma occurring in childhood is in reality a mixed neoplasm and the term sarcoma is a misnomer. Because of the diversity of histologic elements, such growths should be termed "mixed tumors of embryonic origin." The tumor usually destroys the greater portion of the medulla of the kidney, but the cortex remains uninvolved or but slightly affected. Metastasis occurs relatively late, usually not until the capsule of the kidney has been ruptured. The ureter is seldom involved, hence the usual absence of urinary symptoms. Operation is indicated as early as possible.

Localization of Spirocheta Pallida in the Heart-muscle in Congenital Syphilis.—A. S. Warthin and E. J. Snyder (*Jour. A. M. A.*, 1912, lviii, 689) record two cases in which spirochetes were found only in the heart. The first, an infant of two months and twenty days showed rough skin and cutaneous lesions about the nostrils, mouth and anus. At autopsy, pale, translucent areas the heart showed characteristic pale degeneration of the muscle-fibers, epithelioid proliferation of the stroma, cellular infiltrations, fatty degeneration, etc., described by Warthin as characteristic of congenital cardiac syphilis. In the Levaditi preparations those areas showed enormous numbers of spirochetes. No histologic lesions of syphilis and no spirochetes were found in any organ or tissue except the heart-muscle. No sections were made of the small erosions and ulcers about nostrils, mouth and anus, so that the presence or absence of spirochetes in those was not determined. The second case was illegitimate infant eight days old. The child developed "snuffles" a few days after birth, and a papular eruption over the palms of the hands and soles of the feet. It died of "asphyxia." Smears of the cut surface of the heart showed numerous spirochetes, the palmar surfaces and the soles of the feet were rough and cracked. The mouth, nose and anus showed small erosions and fissures. The scalp behind the ears was roughened and eroded. The face and buttocks became very sore and ulcerated extensively. The infant lost weight rapidly, temperature became subnormal; food was refused, and death occurred from inanition. No spirochetes were found in the discharge from ulcers. Neither the lungs, spleen and liver, nor any other internal organ showed any microscopic lesions of congenital syphilis, and in the Levaditi preparations no spirochetes could be found anywhere except in the heart. The skin lesions were not examined microscopically. The fact that the heart may show marked lesions in cases of congenital syphilis when the liver, lungs and spleen show no changes at all and no spirochetes, has a great practical importance in pathologic diagnosis, since in ordinary routine work signs of congenital syphilis are usually looked for in these organs alone.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

THE MANAGEMENT OF APPENDICITIS IN CHILDHOOD.

BY

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APPENDICITIS in children merits special consideration because of its frequency, its obscure symptomatology, its peculiar clinical course, and its special rules of treatment.

Appendicitis in the child differs in many details from the adult type because the child is more than a miniature adult. The child presents special characteristics in his anatomical relationships; there is a difference in the plasticity of the tissues, the inflammatory reaction, the operative risk, and the after-treatment.

Appendicitis in children is especially frequent in the period between the fifth and fifteenth years. It is uncommon before the fifth year and rare in children under two years of age. Boys are more frequently affected than girls.

Among the anatomical differences in the child and adult it must be remembered that the relatively shorter lumbar region of the child causes the cecum to lie at a comparatively higher level, and then *the appendix is situated higher than McBurney's point.*

Again, the infantile appendix is relatively larger as compared with the rest of the alimentary canal than in adults, while the walls are much more delicate, especially the submucous coat. The junction of the appendix with the cecum is sometimes funnel-shaped, the apex of the funnel being continued into the appendix. It is evident that foreign bodies in this type of appendix readily make their entrance as well as their escape.

Drainage is superior in the infantile appendix since in the smoother mucosa, and greater lumen, there is less tendency to the formation of valves which close its cecal opening. Finally, it must be remembered that in the infant *there is no line of demarcation between the abdomen and the pelvis.* The pelvis is but the

cone-shaped terminus of the abdominal cavity. At this period the bladder is in greater part an abdominal organ, the uterus does not occupy the true pelvic cavity, while the ovaries and Fallopian tubes rest in the iliac fossæ. It is not until the child begins to walk that there is any striking change which differentiates the abdominal and pelvic cavities.

There are several points of difference in the pathological process which should be kept clearly in mind.

Appendicitis in children is not so fatal an affection as in adults because the infant's appendix is less prone to perforation and gangrene.

The tendency in the child is toward the formation of a localized abscess—at the first onset of inflammation the omentum promptly offers its protection by wrapping itself about the diseased organ, thus walling it off from the general peritoneal cavity. Hence unless the abscess ruptures, general peritonitis is rare.

Not only is there found the primary abscess surrounding the appendix, but, as the disease evolutes, secondary abscesses are found which may communicate with the primary focus by a narrow canal, or be completely separated. This condition is notably illustrated in the secondary pelvic abscesses. The two foci may develop simultaneously or the pelvic suppuration may appear after the iliac.

Again, abscess may appear in the left iliac fossa or in both fossæ at the same time. The so-called left-sided appendicitis in children is usually a secondary iliac abscess situated on the left side.

It is also to be remembered that multiple purulent foci independent of each other may become encysted, and if the surrounding adhesions are inadequate for defense they may at any time rupture into the general peritoneal cavity and set up a diffuse peritonitis.

Not only is there a tendency to localized suppuration of neighboring parts, but to the involvement of the organs at a distance—such as subphrenic abscess, abscess of the lung, liver, brain, and parotid.

Not infrequently does a pleural empyema follow in the wake of appendicitis, and as Kelly observes: "It has happened in several instances that a pleural empyema has been discovered and operated upon, while the primary abscess, a suppurating appendix, has not been discovered until the postmortem."

Finally, let it be emphasized that the pathological picture in

the appendicitis of childhood is the picture of localized suppuration.

It is this fact that explains why the disease is less fatal in childhood than in adults, and why so many untreated or badly treated cases survive in spite of procrastinating measures which in the adult would prove fatal.

Mother Nature never leaves her children wholly unprotected; for every defect there is some compensatory provision; and if the child cannot intelligently articulate its abdominal distress, yet it is not without a sign; for the handwriting is on the abdominal wall so that he who will may read.

Symptomatology.—In considering the symptomatology of appendicitis in children the physician must appreciate that he is not dealing with a miniature adult; the child can neither analyze its sensations or intelligently articulate its distress. There is no reliable evidence except the previous history as obtained from the parents, and the objective symptoms. It is obvious that the skilled observers must understand the child nature and be able to properly estimate the value of the symptoms under disadvantages which do not obtain in the adult.

When called to treat a child with bellyache, vomiting and fever proceed at once to prove that it is not appendicitis before attempting to prescribe. *Much damage has been done by the routine practice of prescribing for abdominal pain without making a careful examination of the abdomen.*

Get a careful history from the parents and note if gastrointestinal disorders have preceded the attack. They play an important rôle in the etiology of appendicitis in children.

Find out if there has been any undue desire to empty the bladder, or painful micturition. This is a significant prodromal symptom.

Next examine the thoracic viscera. *An acute abdomen and right iliac pain are often the first signs of a pneumonia or pleurisy.*

If the child is old enough it may be able to localize its pain in the region of the appendix and the physician may elicit tenderness over McBurney's point. With these two facts the attention is immediately directed toward appendicitis.

Muscular rigidity that most valuable sign in adults cannot be depended upon in children, since the young child resists any attempt to examine the abdomen, and obscures its local and comparative significance by straining and putting up a general muscular defense.

Cutaneous hyperesthesia is often significant of appendicular inflammation. A sharp pain is elicited when the skin is lightly touched.

Never fail to make a rectal examination in every case of suspected appendicitis.

In a child the palpating finger can easily explore the cecal region and obtain valuable information. Besides this method is more gentle and less injurious than deep palpation from the outside. *If the child is intractable these examinations should be made under slight ether anesthesia.*

Always remember in palpating a child's abdomen, even if under anesthesia, that gentleness is essential, and that more than ordinary care should be used in order not to rupture the extremely delicate adhesions. When with pain, tenderness and rigidity there is associated a palpable mass in the right iliac fossa, the diagnosis is no longer doubtful.

The general symptoms of fever, acceleration of pulse, vomiting, constipation or diarrhea are evidences of toxic absorption and must be given due consideration in connection with the symptoms described above.

Due regard should be given to *posture symptoms*, such as stooping, limping, and their association with appendiceal abscess must not be forgotten.

The prevalence of appendicitis has directed the popular mind toward a state of expectancy whenever there is abdominal pain, and this in turn usually prejudices the mind of the physician.

Every case of suspected appendicitis is a problem which requires the surgeon's calm judgment before he employs the knife.

Treatment.—As soon as appendicitis is suspected it is the merest folly to teach that there are two methods of treating appendicitis—that the family physician is to carry the case along as far as he can and when his medication proves futile, call in the surgeon to inaugurate an entirely new method of treatment.

There is only one treatment of appendicitis. In this treatment the physician and surgeon each play an important rôle—a rôle of co-operation; each bears an equal responsibility, each contributes his share to the favorable or unfavorable result.

The results of the modern treatment of appendicitis, favorable as they are, can never be what they should be until the physician and surgeon are reconciled in a unity of purpose and a uniformity of procedure.

There is no medical and surgical treatment of appendicitis—

the treatment is pre-operative and operative. This definitely fixes the status of the physician and surgeon; the one preparing the patient for operation, the other performing the operation.

The preparation is just as important as the operation, and the operative results will not improve until the surgeon receives the patient rationally prepared. When the physician therefore suspects appendicitis his further treatment should be directed toward preparing the patient for operation—that is, toward putting the patient in the best possible condition to receive the benefits of operation. He must be familiar with the fact that in all acute abdominal conditions the aim is to put the gastrointestinal tract in a state of quiescence; that the great disturbing factor is peristalsis and that everything which stimulates peristalsis is to be eliminated. The introduction of food and the use of cathartics are the two disturbing elements, the use of either increases peristalsis, and hence helps to distribute rather than to localize the infection.

In the pre-operative treatment therefore the indications are:

1. Keep the patient as quiet as possible.
2. Since children do not bear well the deprivation of nourishment by mouth, give them that which creates the least intestinal disturbance—water, egg albumen. The child's nutrition will not be seriously impaired by this diet at least for twenty-four hours.
3. Never prescribe a cathartic. A purge is the most deadly medication that can be employed in any acute abdominal condition.
4. Apply an ice-bag to the abdomen. That the sedative effect of the ice-bag has an inhibiting effect upon localized inflammations is well established.
5. The employment of small doses of opium after the diagnosis has been established, quiets the patient and exerts a beneficial influence upon the local process.

The foregoing principle of treatment gives the child its best chances in combating a subtle foe; for it is the employment of nature's method of local rest whenever there is local inflammation. Furthermore, it gives the surgeon the assurance that his problem has not been complicated by a preliminary skirmish that has only weakened the lines of defense, but that the physician's view-point has been distinctly surgical from the beginning and that each is contributing his share to the solution of the same problem.

Let it be understood then that *the treatment of appendicitis is distinctly surgical and that he who treats it assumes the rôle of*

surgeon. He who practises the expectant treatment shoulders a large responsibility, for the results of early operation are just as good as in adults, and that the threatening phantom of general peritonitis casts his shadow upon every case unrelieved by operation.

The rule then is to *operate upon every case of appendicitis early, while the disease is confined to the appendix*. There is danger only when the disease gets beyond the confines of the appendix. This is the ideal treatment and the mortality is practically nil.

The important consideration for the general practitioner situated as he often is far from those skilled in abdominal surgery, is not when to operate, but when it is safe to wait. It is obvious that no hard or fast rules can be formulated for a disease so conspicuously treacherous.

While mild attacks of appendicitis do recover without operation, no physician can prophesy at the beginning of an attack what the outcome is going to be, and it must be remembered that the conservative observant treatment cannot be inaugurated without great responsibility.

If the case comes under observation of the physician three or four days after the initial attack and the local and general symptoms show signs of abating, and the exudate is being absorbed as shown by repeated palpations per rectum, operation is not indicated. If, however, the exudate does not diminish after six or seven days, operation is indicated to remove the suppurating focus and thus prevent the general diffusion of the infection from a possible rupture of the abscess. Deavor advises deferring operation "in cases where there is a localizing abscess with diffuse peritonitis, general abdominal tenderness with more or less tension and bimanual rigidity, moderately high temperature and rapid pulse, with a low leukocyte count and a large percentage of polymorphonuclears." Such cases, however, must be placed in the Fowler position and the ice pack applied to the abdomen, saline is to be given by rectum, and they are to receive no nourishment by mouth and no cathartics. After the acute symptoms have abated and the abscess is well localized it is evacuated. It is evident that these cases belong in the hospital where the details of treatment can be under the direct supervision of the surgeon.

In the chronic forms of appendicitis associated with gastrointestinal disturbance, operation should be done in the interval between the acute attacks. This procedure is practically free from danger and relieves the patient of the chronic gastric distress.

MINOR POINTS IN INFANT FEEDING.

BY

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MUCH has been written on percentage compositions of food, on caloric values, and the rôle played by the various food elements in infant feeding and on similar technical points. All of this is important to the specialist, but I sometimes think that in our pursuit of scientific accuracy we are likely to overlook the many small and apparently trivial details—the practical points in the problem of feeding the baby.

These points when massed have, I believe, quite as much to do with the success of our work as do the most abstruse problems. It is to the consideration of a few of these minor points that I wish to call your attention.

Lime Water.—The majority of text-book formulas call for lime water in varying proportions. Its use was advocated in the early days of infant feeding, because of the supposed alkalinity of of mothers' milk, and the desire to neutralize the acidity of cows' milk to correspond.

When later investigations were made and the acidity of mothers' milk was demonstrated, lime water was still continued because of its action upon the curds of cows' milk. It does undoubtedly break up the coarse curds of cows' milk and so make them more digestible but in so doing it changes the character of the milk and puts it in the class of partially pre-digested foods. Is it necessary to do this? Is it ever wise to add a chemical to the diet if it can be dispensed with? These were the questions which we asked at the Babies' Dairy when we began our work there in 1908. Experimentally, at first we omitted all lime water from our formulas and we have never used it since, in the successful feeding of a series of over five hundred cases. In my own opinion it is as unnecessary to add lime water to the babies' food as it is for an adult to habitually take a teaspoonful of sodium bicarbonate after meals.

Another drug has too often found its way into the infant's stomach by way of bottle or nipple—boric acid. We legislate this drug out of our own food and at the same time advise mothers to sterilize the babies' nipples and bottles by soaking

them in boric acid solution. In our work we have found that bottles and nipples may be sterilized in the usual way, by boiling, with nothing worse than an occasional broken bottle, and we feel sure that all the germs are killed.

Barley water or other cereal gruels are much in vogue as milk diluents. In general, directions for its preparation call for continued boiling before the milk is added to it. Unless specially directed, mothers will, in a majority of cases, add the milk to the cereal gruel while the latter is still hot thus raising the temperature of the mixture to a point which is ideal for the growth of bacteria. Recent tests have shown us that raising the temperature of our milk above seventy degrees for even a few minutes will increase the bacterial count enormously.

Milk Sugar.—Milk sugar has until recently been added to all formulas with scarcely a thought as to its effects. Of late the Germans have criticised its use in cases of diarrhea and have tried to substitute malt sugar and dextrin. Whether we accept or reject this theory we may, it seems to me, at least reduce the amount of milk sugar in our formulas with benefit. Sugar is a heat producer and a frequent cause of intestinal fermentation and often causes fermentative diarrheas in the summer months, and various forms of skin eruptions at all times. The future may teach us that it may be omitted entirely from the cows' milk formulas.

Above all I wish to emphasize the great importance of cleanliness and technic in the preparation of the formula by the mother. Every physician is familiar with the details of this technic but how many of us impress its necessity upon mothers? The doctor himself should supervise the preparation of the food at least once.

The quantity of food at each feeding must be adapted to the individual infant. If too much is used, or the bottle is given too rapidly, vomiting occurs and the fault is too often attributed to the formula used, and a needless change is made.

In the same way, if the stools are loose or greenish, at the beginning of artificial feeding the formula is again blamed and a radical change is made, when perhaps a reduction of the quality or quantity of the food will remedy the trouble, or it may be that these slight symptoms are only normal evidences of the stomach's efforts to digest a food which is biologically unfit for it, and which it must learn to digest. A few days and these "mother-alarming" symptoms will be forgotten.

The successful infant feeder must know food values, but

above all he must practice the art as well as the science of infant feeding. And this means untiring attention to minor details, infinite patience in educating mothers and nurses, and a goodly mixture of common sense in each bottle of food.

8 WEST FORTY-NINTH STREET.

EMPYEMA OF INFANCY.*

BY

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My object in presenting this paper is first to show the possibility and necessity of early diagnosis even before classical symptoms are present, and secondly to review in brief the signs of fluid and pus in a child's chest. It is my intention to demonstrate that the diagnosis of a classical case is really dependent on one symptom alone, namely percussion, and that the other symptoms of fluid must be considered subsidiary and confirmative and their absence of no moment in making a positive diagnosis.

I feel certain that some among you will heartily disagree with the above, and, in fact, will want to know why signs should be so radically different between fluid in a child's chest and the same condition in the adult chest, but the size of this paper will not permit me to enter into a theoretical discussion of reasons but I shall be able merely to state facts as I have observed them. My conclusion has been drawn from a comparatively wide experience, in both private and hospital practice, and although I will admit the possibility of error, my belief is firmly based on the fact that where the percussion note indicated fluid, in only two cases can I recall a false diagnosis, as indicated by a dry puncture and subsequent events in the case. In the majority of cases, so far as the signs appealed to me, there were no other signs such as are usually found in fluid of adult cases, and I feel fairly certain that had I waited for such other symptoms of fluid there would have been a delay of the puncture for several days, and in other cases no puncture at all. It is true that the importance of the percussion note in diagnosis of fluid in a child's chest has been spoken of before, but it is not the priority but the vast practical importance of the subject that should be considered.

* Read before the Alumni Society of Lebanon Hospital, March 6, 1912.

The prognosis of a case of empyema is at all times dependent upon its early recognition and the sooner it is recognized the better is the chance for recovery. This fact is particularly true in children whose empyema occurs during or after a pneumonia, and the responsibility rests upon the physician to detect the condition before the child is overcome by toxic absorption. It has been my observation in such cases followed throughout their entire course, that empyema is a gradually developing process of at least two or three days' duration and such being the case it devolves upon us to recognize this condition in its early stages, long before the classical signs are present. Were the presence of pus an innocent occurrence, there would be, perhaps, an excuse for waiting; but where delay means a poorer prognosis there can be no benefit derived by waiting for more typical symptoms.

The problem of recognizing empyema early, especially during the active stage of pneumonia is a most difficult one and as we know most vital for the interest of the infant. It is not uncommon for empyema to develop during pneumonia and this fact alone ought to put us on our guard for its detection. If we are to detect an early empyema we, of course, must not expect any distinct signs or symptoms and even if present the underlying active consolidation would detract from their value. It is in these cases especially that we are to rely on our power of intuition and ability of proper interpretation. We are to consider all the signs and symptoms present and if one or more of these signs cannot be explained by the underlying consolidation we must suspect the possibility of pus (fluid).

These extra signs may appear incidental and unimportant and can only be explained by the possibility of some complication, but if properly interpreted it is surprising how often they can be explained by a possible underlying empyema. No definite rule can be laid down, each case must be judged separately. In one case it is the peculiar course of the temperature, in others some physical signs, and in others some combination of symptoms and signs. But in all these cases an exploratory puncture is indicated and although it may be negative in a certain proportion of cases, pus will be found in a sufficient number to justify its use in all doubtful conditions.

I feel that the tendency is to respect the needle puncture a little too much. Personally I do not hesitate to use the needle in any doubtful cases especially where there are symptoms of

pus even though distinct signs of fluid are absent. I do not mean to sanction the indiscriminate use of the needle, but I feel that empyema is too serious a condition for us to tarry in the presence of some unexplainable symptom or symptoms that can be explained best by the presence of pus. At its very worst a puncture ought to be attended by very little danger and the operative procedure is too small a matter to be of any consideration.

I will report three cases to illustrate the possibility of early diagnosis and the value of an exploratory puncture.

CASE I.—A. C., five months old, breast-fed, admitted to hospital on fourth day of disease with a pneumonia of lower left lung; distinct physical signs, with temperature of $103-104^{\circ}$. On sixth day after admission child showed auscultatory signs of resolution and temperature still ranged high with no change in the percussion note. On the following day, the signs were unchanged. The fact that the child showed some signs of resolution but unchanged temperature and percussion note made me suspect a beginning empyema as these two signs could easily be explained by this condition. Puncture showed very thin pus.

CASE II.—A very interesting case, and, although the child died, the value of early puncture is distinctly shown as it gave the child the only possible chance it had.

F. K., ten months, breast-fed, ill five days before admittance to hospital. Temperature ranged $104-106^{\circ}$ with white blood cells 23,000. There was dullness (no flatness) over the entire right side behind with a few râles and no bronchial breathing. Breathing was almost vesicular in character and not diminished. The fact that the child had dullness and no bronchial breathing made me suspect a central pneumonia with moderate fluid in the pleural cavity. A needle was inserted on the same day but a dry puncture resulted. The child became cyanosed in the evening and the needle was inserted again; a few cubic centimeters of blood were obtained. Early next morning the child was moribund and pus obtained by an exploratory puncture. The child died two hours later. In this case there was no way of explaining the dullness without bronchial breathing with all other symptoms of pneumonia except by pus.

CASE III.—A. F., nine months; breast-fed, was ill two days before admission. Temperature $103-104^{\circ}$ with dullness over right side behind and high-pitched breathing over apex behind. Two days later bronchial breathing over apex, dullness to flatness persisting below the upper lobe. No auscultatory changes at the base. A more or less flat note at the base without auscultatory changes suggested the possibility of early pus, and exploratory puncture on the same day, (*i.e.*, three days after admission); showed the presence of pus.

These three cases I hope will show the wide range of pos-

sibility of early diagnosis. It will also show that we are not to be guided by any set dogma, that each case with its symptoms must be considered separately and when any one symptom or set of symptoms cannot be explained except by the possibility of empyema we must not hesitate to use the needle. It is true that we will be disappointed in not a few instances, but successes are sufficiently numerous and the dangers of waiting are too evident not to justify early puncture.

The diagnosis of a developed case of empyema is of course simpler and although we have more distinct physical signs to guide us, still I feel that it would be a grave mistake to wait for such symptoms as we usually find in adults. I fear very much that if such were our procedure a good many cases would have a delayed diagnosis and many no diagnosis at all. It may appear strange but it is nevertheless a clinical fact that fluid in an infant's chest, especially pus, does not give the usual signs of fluid and we must make up our minds not to expect them. Personally I have had a rather large experience with empyemas and I can recall but very few instances where all the symptoms of fluid were present and I feel certain that had I waited there would have been a grievous delay or no diagnosis at all.

My experience has taught me to await but one diagnostic symptom in a case of empyema, namely, *flatness* on percussion, and a flat note extending down to the base to me at least means free pus in the pleural cavity and I never hesitate to insert the needle irrespective of the presence or absence of any or all other symptoms. In fact, in my opinion a flat note is already a sign of a developed case and I can see no advantage in waiting for other signs. Pus is certainly too dangerous a material for a child to retain and even though we may be wrong, the advantage of quick diagnosis surely overbalances the slight inconvenience of a thoracentesis. Even if the flat note does not extend down to the base we must suspect some form of lung complication other than pneumonia and in the few instances where such was the case, one proved to be an encapsulated empyema and the other an abscess of the lung.

I am not prepared to offer any theoretical reasons why symptoms of fluid in a child's chest should differ so radically from that of an adult, but as a clinical fact it is true and clinical truths should always be placed above theoretical considerations.

The true meaning of a flat percussion note has so impressed me that I now invariably use the needle, and in the great number

of cases that have come under my observation I can recall but two instances where subsequent events showed a false diagnosis. Of course, there may be other signs but I hold that their presence is unnecessary for a diagnosis. Often they are not present at all and it is the flat note alone which will guide us.

Auscultation and voice signs are very uncertain ones and in the majority of instances of no assistance at all. The expected diminished or distant bronchial breathing and voice is as a rule absent and the auscultatory signs are either those of a healthy lung with a few râles or those of the underlying pneumonia.

The change of the percussion note with change of position is to me at least of very little importance; unlike free fluid, empyema does not seem to extend to the anterior part of the chest. It does not show the Ellis curved line. The inflammatory changes are more intense, the pleura more thickened and the fluid itself being pus is not so mobile as ordinary exudative fluid. I feel that for the general practitioner it is too delicate a sign to be of any assistance.

A sign to which some men attribute considerable importance is displacement of the heart. I will not doubt their statements that the heart is displaced, but I cannot satisfy myself that the heart is displaced sufficiently to be of any importance. We must remember that the location of the apex beat in childhood varies according to the age and that would presuppose our knowledge of its location before the child became ill. Furthermore, inasmuch as the pus seldom enters the anterior pleural cavity the amount of displacement cannot be very great. Even under ordinary conditions it is extremely difficult to map out the child's heart. The x-ray shows that we are usually wrong, and to depend on a slight displacement for a positive diagnosis is again, I say, too fine a sign for the ordinary practitioner.

There will be cases where the signs are very misleading and cases which have the signs of pus but where the puncture is repeatedly dry. In such instances, as in fact in all cases of pus, the radiographic picture will surely be of assistance.

THE USE OF THE FLEXNER SERUM IN CEREBRO-SPINAL MENINGITIS.*

BY

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THE history of cerebrospinal meningitis dates from the year 1805, when the disease was first recognized during an outbreak in Geneva. Later, in the year 1806, it appeared in this country in the city of Boston and the neighboring section of New England. Our present conception of the disease dates from the year 1887 when Weichselbaum discovered the diplococcus intracellularis, and twenty years later, in 1907, when Simon Flexner of New York gave to us the first scientific and intelligent means of treating the disease by producing an antimeningococcus serum.

Since the earliest recognition of the disease hardly any portion of the world has escaped it either in an epidemic or sporadic form. France, England, Holland, Germany, Denmark, Greece, Roumania, Turkey and Africa have all had their epidemics at some time or other. On more than one occasion its serious nature and high mortality have been brought home to us here in the United States by outbreaks in Kentucky, Minnesota, Missouri, Mississippi and elsewhere. Particularly here in New York were we made to realize its serious import by an epidemic in the winter of 1904 and the spring of 1905 during which there were between two and three thousand cases reported with a mortality of about 79 per cent.

But to-night it is for me to consider only its treatment and in doing so under the title of the Flexner serum we must not forget for the time, that cerebrospinal meningitis may be caused by one of several germs, either the tubercle bacillus, streptococcus, staphylococcus, pneumococcus, gonococcus, colon bacillus, the bacillus of influenza, and the diplococcus intracellularis, or as it is now called, the meningococcus. It is with a single type of the disease, that of which the meningococcus is the causative factor, that this paper is concerned because it is only in this form of meningitis that the Flexner serum is suitable for treatment.

The treatment of this disease has varied much and has passed

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through a long development stage before being brought to the successful and satisfactory results of the last five years. The treatment has consisted of ice bags along the spine and to the head, of counterirritation to the spine by means of the paque-lin cautery and at times with blisters, of blood letting either with leeches or by venesection, the withdrawal of the spinal fluid to relieve the pressure; the injection of colloidal silver or lysol into the spinal canal; and the use of the diphtheria antitoxin during an outbreak in Hartford some years ago. Even surgery has taken a hand in the treatment for in some cases a resection of one of the vertebræ and drainage has been done. All of these local measures have been supplemented by internal medication in the form of bromides, chloral, potassium iodide, ergot, belladonna and other drugs.

Happily the day of experiment in treating this disease (and I speak of it only when caused by the meningococcus) has given way to other, better, more rational and more positive plans of treatment, and the discovery of the meningococcus, which is now recognized as the sole cause of the epidemic form of the disease, has been followed by the discovery of a bactericide, almost as promising in its results at the present time as were the early results with Behring's antitoxin for diphtheria. During the epidemic of 1904 and 1905 a commission of experts was appointed by the Health authorities to make a study of the disease and to suggest the best means of treatment. Dr. Flexner, of the Rockefeller Institute, was a member of that commission. In 1907 he announced not in a positive but rather in a hopeful and encouraging way (as can be seen by his articles in the *Jour. of Experimental Medicine*) that he had prepared a serum which he thought was curative for the meningococcus form of the disease. What this meant can best be estimated by the fact that the mortality rate before this was 70 to 80 per cent. Flexner's early study of the disease was done with monkeys, goats, rabbits and guinea pigs, but the horse was the animal from which he finally obtained the serum suitable for use after treating the animal for eight months with immunizing doses of the toxin. This serum was first used during an outbreak of the disease in Akron, Ohio, in 1897. About the same time that Flexner was experimenting here there were like enthusiasts elsewhere working along the same lines and the records speak of the Kolle-Wasserman and the Ruppel sera in Germany, the Dopter serum in France, of the Burroughs and Welcome serum and the Jochmann's

serum. But to-day even in these foreign countries the Flexner serum has almost altogether supplanted the others.

Unlike the diphtheria antitoxin which fights only against the products or toxins of the germs, the Flexner serum acts directly on the bacteria themselves and not on their products and for that reason is a bactericide and not an antitoxin in the true sense. What has this serum actually accomplished? It is by results rather than by mere statements that we are able to judge of its merits. Previous to its discovery the lowest mortality any year was about 58 per cent. and averaged in most epidemics between 70 and 80 per cent. In an article in the *Journal of Experimental Medicine*, September, 1908, Flexner reports 393 patients treated with his serum of whom ninety-eight died—a mortality of 25 per cent. In that same article he reports having treated twenty-two children under one year of age and eleven, or 50 per cent., recovered. It is well to remember that it is among infants that the greatest mortality has been observed. Again, in 1908, Koplik, of New York, reports in the *Medical Record*, thirteen cases treated with only two deaths. In 1908, in the *Journal of the American Medical Association* (June), Miller and Barber report twelve cases in which the serum was not used and only one recovered—a mortality of 91.6 per cent. Of the four cases in which the serum was given three recovered, and the fourth patient was likewise getting well when the supply of serum gave out.

Before the American Pediatric Society, in 1908, Flexner reported 322 cases treated with the serum here and abroad; 247 in this country of which sixty-eight died and 147 recovered—a mortality of 27 per cent. In Great Britain he reported a mortality of 30 per cent. out of seventy-five cases, whereas previous to that time the mortality had been between 75 and 80 per cent. At the same meeting Knox and Sladen, of Baltimore, reported twenty-one cases with three deaths and eighteen recoveries, a mortality of 14 per cent. Previous to serum treatment they said that the highest mortality from this disease in Baltimore was in 1906 and was 100 per cent., the lowest death rate in any year was in 1899 when it was 43 per cent. Dunn at the same meeting reported forty cases treated at the Children's Hospital in Boston and in his private practice: nine died, thirty-one recovered, a mortality of 22 per cent. He reported the death rate as only 8 per cent. when the serum was used the first week and 77 per cent. when it was used after

the second week. Churchill of Chicago reported in 1908 nine cases treated, with four deaths, but one of these was not given the serum until the tenth day of the sickness. Wilkenson reports ten cases at the Garfield Hospital in Washington with seven recoveries and three deaths.

Finley and White in the *Montreal Medical Record* for 1908 report eight cases with four recoveries. Ker in the *Edinburgh Medical Journal* gives thirty-three cases treated and a mortality of fourteen or 42.3 per cent. as against a mortality of 80.5 for 108 cases otherwise treated. Fulton in the *Boston Medical and Surgical Journal* in 1908 reports nineteen cases with 20 per cent. mortality. Dunn, of Boston, in March, 1908, reported fifteen cases treated with eight recoveries. There were two deaths, but five patients were still sick at the time of his report. Marsh and Williams in the *British Journal of Diseases of Children* report fourteen patients treated with the serum twelve of whom were under one year old, with seven recoveries, but of those who died three were not treated until late in the disease.

Flexner in October, 1909, in the *Journal of the American Medical Association* reports, from a study of the cases in France a mortality of 25 per cent. when treated with the serum, and 80 per cent. when treated otherwise. Holt, in the *New York State Medical Journal*, June, 1909, gives the results from statistics for 523 cases—368 recovered, 155 died, a mortality of 29.6 per cent.

It is interesting to note in connection with this report of Dr. Holt, a comparison of the average duration of the disease when treated with the serum and the nonserum cases as reported by the Department of Health. The Health Department report shows for 1905 that in only three per cent. of the cases was the duration of the disease one week or less and in 50 per cent. it was five weeks or longer. On the other hand, the average length of the sickness for 220 cases treated with the serum was eleven days.

Coming down to the year, 1911, Holt reports from the Babies' Hospital an observation of 300 cases of meningitis in which twenty-four of these were due to the meningococcus and of those which received serum treatment eight died and six recovered. In passing it is well to remember that the earlier the treatment is employed the better the results, as shown by Flexner who reports 123 cases treated the first to the third day with only sixteen fatalities; 126 treated the fourth to the seventh

day with thirty fatalities, and 112 treated later than this with thirty-nine deaths. During 1911 there was an epidemic in Athens, Greece, and twenty cases treated with the serum all recovered. Spingarn of Brooklyn in the *N. Y. State Medical Journal* of October, 1911, reports a case of meningococcus meningitis in a three months old infant successfully treated. The case was brought to him on the seventh day of the child's sickness at the Jewish Hospital Dispensary.

In the Johns Hopkins Hospital, Report for 1910, Sladen gives twenty-three cases treated and nineteen recoveries, a mortality of 17.4 per cent. It is a point of interest to note that Cushing and Knox of Baltimore have both used the serum by tapping the ventricles instead of doing a spinal puncture. Both met with bad results although Dr. Fisher at the New York Academy of Medicine in 1910, reported using the serum in this way on an infant two months old with a recovery in spite of the fact that the child had been sick for three weeks when submitted to the treatment.

As to the method to be followed in using the serum, Flexner, and all those who have made a study of the matter, say it must be injected into the spinal canal and not subcutaneously or intravenously. It is advised to place the patient on his side with the thighs flexed on the body as much as possible and lying towards the edge of the bed. The space between the third and fourth lumbar vertebrae is then about on a level with the crest of the ileum and it is in this space that the spinal puncture is made. As now done by the Board of Health the spinal fluid is allowed to run off through a canula and an amount of serum equal to the amount of spinal fluid that escaped is allowed to enter the spinal canal through gravity and is not forced in. A repetition of the injection is made every twenty-four hours until some reaction takes place and some have even repeated the dose within twelve hours. Thirty centimeters seem to be the amount of serum generally used at the first injection but if 40 or 50 c.c. of spinal fluid have been withdrawn the same amount of the serum may be used.

The following case was one of cerebrospinal meningitis with typical symptoms. Recovery ensued after treatment with the Flexner serum as prepared now by the Health Department.

F. M., female, aged five and one-half years. The patient resided in Brooklyn, and was one of two children born of healthy parents. She was taken suddenly sick on Saturday, July 15,

1911. The child complained in the afternoon of that day of not feeling just right, had some fever, nausea, headache, and was heavy and drowsy. The mother thinking it nothing more than an upset stomach gave her a laxative and put her to bed. These symptoms continued over night and about three o'clock the next day, July 16, I saw the patient. I found her with a temperature of 102.6, pulse 135, apparently in a sort of light semistupor, with no inclination to move or to be moved, and very restless, especially on being touched or disturbed. The stomach had been irritable all day so that there had been a few slight vomiting attacks and the child had every appearance of being pretty sick. Heart and lungs were negative. There was a slight but not marked suggestion of stiffness of the neck; there was no delirium. Kernig's sign was present but slightly if at all, and the symptoms though suspicious were not sufficiently marked to warrant one in making a positive diagnosis. The parents were told that there was possibly meningeal trouble. Calomel, ice-bag, complete rest and quiet were prescribed. The next day the temperature was up to 104, pulse 140, the stupor was deeper than the previous day and in wakeful moments the child was slightly delirious and Kernig's sign was present. The least movement of the body elicited pain and the stiffness and rigidity of the muscles of the back were beginning to produce a condition approaching opisthotonos. The stomach was still somewhat upset and little nourishment had been taken in the preceding twenty-four hours. With these symptoms of fever, increased pulse, semistupor, alternating with a partial delirium, restlessness, Kernig's sign and rigidity of the back there was now no doubt as to the diagnosis of cerebrospinal meningitis. The value of the Flexner serum in these cases was explained to the parents and a consultation was advised.

A consulting physician was called in the next day, Monday, July 17 (forty-eight hours after the beginning of the attack). He concurred in the diagnosis but scouted the idea of using the serum even though he believed in it, because he said the case was not of the meningococcus type and he thought it was likely of influenzal origin as the patient gave a history of having had a slight cold about ten days previous to this. He thought it would accomplish nothing and would submit the child to more pain so he gave the parents a poor prognosis and told them the patient could not live more than a couple of days. The parents, however, were not satisfied with this and recognizing the fact that heroic treatment was the only hope left, asked me to arrange for the serum.

On Tuesday, July 18, a spinal puncture was made between the third and fourth lumbar vertebral and a clear transparent fluid ran freely from the needle; 40 c.c. of the fluid were withdrawn and a like amount of the Flexner or anti-meningococcus serum as prepared by the Board of Health was injected. Between two and three minutes afterward the little one went into com-

plete collapse; there was apparently no pulse, the lips and finger nails became cyanotic, the skin clammy and cold, and for a few minutes we were all pretty well frightened. We had looked for some collapse, however, and gradually the condition improved. This injection was given at 4 P. M. The temperature was then 100.6°, pulse 130 and respirations 30. That night at 12 P. M. (eight hours later) the temperature had dropped to 98, pulse to 100, and respiration correspondingly lower. The temperature the following day remained about normal, pulse varied between 100 and 110, with an improvement in the child's mental condition. Rigidity and stiffness of the back and muscles of the neck were marked, Kernig's sign was well developed, but the little patient looked bright and the mind seemed to be perfectly clear.

Between this date, July 19, (the fifth day of the sickness) and July 22 (the eighth day) the highest temperature reached was 99.8, but the pulse was more variable, ranging between 80 and 130. On July 19 the temperature had been 101 and spinal puncture was again done and 20 c.c. of serum was injected after a like amount of spinal fluid had been withdrawn. The meningococcus had been demonstrated in the fluid withdrawn at the first injection, so we knew we were on the right track. On this date, July 19, after the second injection there was again a slight collapse, but little as compared with the first. This time the temperature dropped from 101 to 99, but on July 23, the ninth day of the sickness, the temperature was 102 and the pulse 140. All this time the rigidity of the back was marked and the patient cried if she was moved or disturbed the least bit. Another prominent symptom which became noticeable after this time and which continued on and off for ten days afterward was the terrible outcries at night, lasting at times a good part of the whole night, and of such a nature as to be heard by the neighbors across the way. Around this time too her urine became markedly heavy with a thick sediment, was passed involuntarily, and showed pus and albumin. In the way of medication she was now getting besides the serum, urotropin and bromides and chloral when necessary, ice packs to the spine and a rubber ice coil to her head. At times too it was found necessary to stimulate her with small doses of whiskey but this was only used as her pulse required it. She was able to take some light nourishment. On July 24 (the tenth day of her sickness) the temperature was 103 and she was given 30 c.c. of serum after a like amount of spinal fluid had been withdrawn.

During these ten days she had received 90 c.c. of serum. The next day at 4 A. M., the temperature was 99 but rose again to 102.4 and 12 c.c. more of the serum was injected after a similar amount of spinal fluid had been taken off. This was a smaller amount than usually injected, but there was only a slight amount of the fluid that came away and it was thought well to replace it by an equal amount of the serum as this is the

ordinary method followed. Her temperature between this date, July 23 (her thirteenth day) and July 31 (her seventeenth day), ran low, averaging most of the time about 100 and the highest being 102.4. The back and neck still remained rigid, the head being drawn back and flexion was impossible. The bladder symptoms were still the same; Kernig's sign was still marked and any movement of the spine elicited great pain. Her mental condition was perfectly clear. The pulse varied somewhat and ran between 120 and 170 and at times it became so rapid it was difficult to count. She received no more serum until August 5 (the twenty-second day of her sickness) and on this date only 5 c.c. as the fluid withdrawn flowed very slowly. Her temperature was now coming down and ran between normal and 100 but her pulse still remained between 125 and 160.

About this time an autogenous vaccine was prepared and on August 10 (the twenty-seventh day of the sickness) she received 200,000,000 dead meningococci. The temperature was now running pretty nearly normal but it was noticed by the nurse and those in attendance that she apparently did not hear anything. Rigidity of the back and neck was still marked and vaccine was again used on August 15 the thirty-second day of her sickness (200,000,000 dead meningococci) and a final injection was made on August 23, the fortieth day of her illness. For the last week or so the rigidity had been growing less marked in her back and neck and we could now place her in a sitting posture, and on the twenty-ninth day of August, the forty-sixth day of her sickness, she was gotten out of bed. She picked up quite rapidly from now on, but it was fully three weeks before she was able to walk at all. She recovered completely except for one unfortunate after effect—there was absolute deafness.

During the period of her sickness she received in all 117 c.c. of meningococcus serum and three doses of an autogenous vaccine containing in all 600,000,000 dead meningococci.

The peculiar features of this case were as follows:

1. The absence of any deep stupor or delirium.
2. The presence of cystitis as a complication as shown by the presence of pus and albumin in the urine.
3. The persistent rigidity of the back and neck that lasted throughout most of the sickness and,
4. The great variance between the temperature (at times 99 or 100) and the pulse (160 or 170).

CONCLUSIONS.

Cerebrospinal meningitis may be caused by one of several organisms. Epidemic cerebrospinal meningitis is always caused by the meningococcus.

Meningococcus infection may show itself in a sporadic case and is not necessarily epidemic in character.

The Flexner serum has now after five years' trial proven its germicidal properties in the meningococcus form of the disease.

It has shown this by reducing a mortality that was formerly between 75 and 80 per cent. to one that is now between 25 and 30 per cent., by the less frequent presence of complications and after effects.

Dr. Flexner in one of his articles says: "It is our belief that the analyses of histories of epidemic meningitis furnish convincing proof that the antimeningitis serum when used by the subdural method of injection in suitable doses and at proper intervals, is capable of reducing the period of illness; of preventing in large measure the chronic lesions and types of the infection; of bringing about complete restoration to health in all but a very small number of the recovered, thus lessening the serious deforming and permanent consequences of meningitis and of greatly diminishing the fatalities due to the disease."

80 OCEAN PARKWAY.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting, of March 14, 1912.

WILLIAM SHANNON, M. D., *in the Chair.*

DR. RALPH OAKLEY CLOCK, read this paper.

INTESTINAL IMPLANTATION OF THE *BACILLUS LACTIS BULGARICUS* IN CERTAIN INTESTINAL CONDITIONS OF INFANTS;
WITH REPORT OF CASES.

BUTTERMILK has been extensively employed in infant feeding and was used by the writer as a dietetic treatment for malnutrition, enteritis, etc.; but the results obtained from its use have not been notably favorable. The beneficial effects that have sometimes followed the use of buttermilk as an infant food have been due to the large amounts of soluble proteid furnished in finely subdivided form.

Metchnikoff has shown that it would be possible to arrest the growth of putrefactive bacteria by introducing cultures of lactic acid bacilli into the intestine. The *Bacillus lactis bulgaricus* has been found to exert a most pronounced effect upon the putrefactive bacteria; and is the only lactic acid bacillus known that will survive ingestion, reach the large intestine, and continue to live there creating nascent lactic acid, which is antagonistic to the growth of the pathogenic bacteria.

Applying the knowledge that the growth of one organism will

inhibit the growth of another, the writer experimented with various preparations supposed to contain the *Bacillus lactis bulgaricus*, but secured no definite result; most of the preparations on the market consisting chiefly of paralactic bacilli.

Through the Johns Hopkins Hospital a pure culture of the *Bacillus lactis bulgaricus* has been imported from the Pasteur Institute. This culture is dried and mixed with milk sugar and compounded into a tablet. As yet, the literature contains no reports of this bacillus having been introduced into the system through the medium of milk sugar for the purpose of arresting the intestinal putrefaction.

The cases which the writer reported show the results obtained with this new method of treatment in bottle-fed babies. Some of the cases were of the most severe type of gastrointestinal disturbance, but a decidedly favorable result followed in every case. The gastric symptoms quickly disappeared, the toxemia subsided, mucus and blood disappeared from the stools, which lost their offensive odor; indigestion cleared up, and the stools become normal in color and consistency on the third or fourth day; and no return of the intestinal condition followed in any case. The treatment consisted solely of the administration of the tablets containing a pure culture of the *Bacillus lactis bulgaricus*. The excellent results which followed this plan of treatment in the first few cases persuaded the writer to continue the treatment without changing the diet, and thus test the reliability of the bacilli as a means of combating the intestinal putrefaction. Under this plan of treatment, all the cases gained in weight.

The writer summarizes and concludes as follows:

1. The cases varied in age from five weeks to ten months.
2. There were two cases of enterocolitis, and twenty cases of gastroenteritis; of the latter, five were of the mild form; nine were of the severe type; and six were toxic.
3. The duration of the gastroenteritis, prior to instituting the implantation method of treatment, was from one day to five days in the mild forms; from one day to two weeks in the severe types; and from one week to two weeks in the toxic forms. The intestinal condition had persisted in the two cases of enterocolitis from two to four weeks.
4. The two cases of enterocolitis had resisted other methods of treatment, but quickly responded to the implantation method.
5. Decided improvement followed in every case within twenty-four hours after beginning treatment.
6. The putrefactive process entirely disappeared, and the stools became normal in consistency and color on the fourth day, as a rule; and, by the end of a week, in spite of previous loss, the weight had increased, on an average, $4\frac{1}{2}$ ounces.
7. The results were complete and permanent in every case: there was not a single failure or relapse.
8. Since the culture was mixed with milk sugar, the tablets

quickly dissolved in water and was readily taken by the babies.

9. One of the great advantages of this method of treatment is that it is unattended with an untoward effect: twenty tablets having been given in the twenty-four hours to infants of five and six weeks of age.

10. Another advantage is that the treatment does not conflict or interfere in any way with the diet of the baby.

11. The diets consisted of condensed milk, top milk formulas, modified milk with Mellin's food, whole milk and barley water, Peptogenic milk, whey and dextrinized barley gruel, and modified milk with milk sugar.

12. The favorable results that followed in the cases which were on a diet of condensed milk, were due to the fact that the *Bacillus lactis bulgaricus* flourishes best in a rich carbohydrate medium; whether this be lactose, maltose, saccharose or glucose.

13. Vomiting invariably ceased on the second day; this is to be explained by the fact that, after the putrefactive process in the intestine had been controlled, the reflex condition in the stomach quickly subsided.

14. Fever was absent in the mild and severe gastroenteritis cases.

15. The temperature which had been present in all of the cases of toxic gastroenteritis and in the enterocolitis cases quickly dropped to normal under the implantation treatment.

16. With one exception, there was steady gain in weight on this method of treatment.

17. One case had been rapidly losing weight up to the time of beginning the implantation treatment; and, while there was a temporary loss during the first three days, the weight after this time steadily increased and showed a gain of 5 ounces at the end of the first week.

18. The average gain in weight during the first week was 4 1/2 ounces.

19. After the stools became normal, the dried culture was administered three times daily for a period of one to two weeks.

20. The negative results previously obtained with the various other dried cultures were unquestionably due to the small numbers of the true *Bacillus lactis bulgaricus* present in the tablets, which contained chiefly the paralactic bacilli.

21. The results in the cases reported were due solely to the action of the *Bacillus lactis bulgaricus*; since no other therapeutic measures were employed, nor was the diet altered in any case.

DISCUSSION.

DR. WALTER LESTER CARR said that the paper just read was of much interest because it contained many clinical suggestions. The statement made regarding the use of buttermilk in infant feeding was always of interest to those who were feeding babies. The value of buttermilk, the soluble proteids, in the feeding of

these children could be obtained for a short time and then it was necessary to increase its calories by adding milk or cream.

With regard to the use of the *Bacillus lactis bulgaricus* and its effect in lessening putrefaction in the intestines, some gain had been made during the past few years and better results had been obtained. However, he could not see any particular reason for continuing milk, a culture medium, when it was the source of the trouble. There was an idiosyncrasy regarding the use of milk in some babies with intestinal infections. He believed that the food that caused the disturbance should be cut out and then they should see what could be done without the use of medicinal agents. The author stated that the length of time required to treat little patients was about one week. In most cases of gastrointestinal infection the period was shortened without a milk diet. Many cases would improve when water only was given after the intestine and stomach had been cleared out and kept quit. Personally he would not think of beginning treatment by continuing a diet which was the source of trouble.

Dr. Carr was willing to assent to beginning the treatment of subacute and chronic cases with the lactic acid bacilli, and with a limited quantity of milk, but he could not subscribe to the continuance of a diet, that was the cause of the infection in an acute case.

At the present time it seemed to be a difficult problem to determine how to get the best cultures. This was now a commercial affair, and many of the preparations in the market did not come up to the standard.

DR. THOMAS S. SOUTHWORTH said at the present time it might be stated that our views concerning so-called summer diarrhea were themselves in a state of flux. On the one hand there are those who cling to the putrefactive bacteria as the cause of such diarrheas, while others assign the rôle to bacteria of fermentation. More recently Finkelstein has estimated that the carbohydrate sugars are more of a menace than the bacteria. We have therefore two schools, those who would stop giving proteids and give carbohydrates, and those who would eliminate the carbohydrates and give massive doses of proteids casein. To this is added Dr. Clock's view that we may continue the customary diet of the patient provided we implant lactic acid forming bacteria.

We all appreciate that lactic acid bacteria will crowd out the putrefactive bacteria in the intestine but it is also possible that the transformation of the carbohydrates by the lactic acid bacilli may tend to prevent their being split into by products which are more irritating to the intestines.

DR. GODFREY R. PISEK said that about five years ago he advocated the use of lactic acid bacteria in the treatment of diarrheas in which there were so many of the intestinal flora propagated. However, after a thorough trial he now believed more in the old fashioned method of treatment with calomel,

castor oil and the use of the temporarily restricted diet. Such a trial as recorded by Dr. Clock might be justified in hospital wards to determine therapeutic values where scientific data could be obtained. He was surprised at the uniformly good results obtained which he did not believe would be possible except in private practice where the children were in previously good condition and had the benefit of the best hygienic surroundings. There was no doubt in his mind that he had obtained some beneficial results by the implantation method, not in acute cases, but in the subacute or chronic cases, such as ileocolitis. If one fed large quantities of lactic acid bacilli to these infants who had been previously starved, the intestinal flora become changed and this fact may be the one which gives the child a greater chance to make a recovery. However, if Dr. Pisek had to make a choice between the old-fashioned treatment and the treatment by intestinal implantation of the *Bacillus lactis bulgaricus*, he said he would at present prefer the former.

DR. L. E. LA FÉTRA said he was very much interested in Dr. Clock's contribution to the clinical study of this subject and he hoped that what he had presented would be of general application. The paper was a very suggestive one and he admired the courage of Dr. Clock in continuing the use of the high fat mixtures in these cases of diarrhea. Dr. La Fétra thought that the length of time the babies were under treatment with the lactic acid bacilli was rather long when one considered the results obtained. In hospitals, these cases did not last so long with a high temperature and frequent stools. It seemed to him that other methods might be employed in addition, especially changing the diet, with improved results. Of course it was necessary for Dr. Clock to do nothing but add the lactic acid bacilli in order to prove his thesis.

Dr. La Fétra asked Dr. Clock about the loss in weight in these cases; some of these babies were sick for a long time and a loss in weight would be expected. He also asked how the lactic acid bacilli worked when given in condensed milk which contained so much cane sugar.

It was difficult to understand the effect of these tablets upon the vomiting occurring in some of the babies.

At the Babies' Hospital some years ago the implantation of lactic acid bacilli furnished by Dr. Charles North in the rectum was used in connection with pure cultures given by mouth. This was in 1908. The results of this treatment were so bad that it was not continued the second year. In looking over the reports of the work during that summer as tabulated by Dr. Hemenway, he found there were twenty-three cases of gastroenteritis and enterocolitis. Lactic acid cultures were given per rectum in doses of 1 to 4 drachms in eight cases and six of these died. One ounce was given in eleven cases and six died. In eight of these patients the lactic bacillus tablet was given by mouth and the culture by rectum and five died. There seemed

to be great difficulty in getting the cultures high up in the bowel.

Dr. La Fétra's impression regarding the advantages of the lactic acid bacilli was a most favorable one, but he had not used the same sort of cultures as Dr. Clock. No one could say a priori which treatment was the better without giving the one suggested a fair trial. His experience with the lactic acid milk had been fairly satisfactory, but his results with the use of lactone milk, made at the hospital, had not been so favorable. He had gotten the best results in diarrheal cases from the use of protein milk. One could use lactic acid milk, made with pure cultures of the *Bacillus lactis bulgaricus* and get good results in these cases.

DR. RALPH OAKLEY CLOCK closed the discussion. With regard to Dr. Carr's question as to the reason for not changing the diet in these cases, his purpose was to test the reliability of the *Bacillus lactis bulgaricus* as a means of combating putrefactive changes in the intestine. He had had some unfavorable experiences in using buttermilk, high proteid and low fat diets; and, in the first two or three cases in which he used the dried culture of the *Bacillus lactis bulgaricus*, he obtained such favorable results that he was persuaded to continue its use in other cases without changing the diet. He presented his paper simply to show the results of these preliminary tests.

In answer to Dr. La Fétra as to what he said regarding the average loss in weight, the Cuban case of enterocolitis had lost nearly 2 pounds in the four weeks previous to the time when he first saw it; but during the time that this case was under treatment, with the culture of the lactic acid bacilli, there was marked improvement and gain in weight, although there was an initial loss of 3 ounces.

In regard to the favorable results that followed in the cases fed on condensed milk: this was to be explained by the fact that the *Bacillus lactis bulgaricus* flourished best in a rich carbohydrate medium; and, although the sugar in condensed milk was not the same as that used for introducing the bacilli into the system, the two sugars were not antagonistic.

With regard to the alleviation of the gastric symptoms, the lactic acid bacilli, of course, had no direct action upon the vomiting; but, after the putrefactive process in the intestine had been controlled, the gastric symptoms which were reflex promptly subsided.

THE PATHOLOGY AND TREATMENT OF CHRONIC STENOSIS OF THE LARYNX FOLLOWING DIPHtheria.

DR. HENRY LOWNDES LYNNAH read this paper in which he classified the different types of chronic laryngeal stenosis following diphtheria as follows: 1. The nervous type which was accompanied by a marked element of fear of impending danger, the little patients being in a condition bordering on convulsions

when put upon the tables. In such cases there was often a marked spasm which made extubation difficult, and frequently when the tube was raised it would slip off of the jaw of the extractor and be sucked back as it were into the larynx. When the tube was finally removed there would be a violent spasm and reintubation would be necessary. This condition was only overcome by general anesthesia and then would return when the patient awoke. 2. The spasm type without nervous element, a condition due to long-continued wearing of the tube which caused a temporary functional disuse of the intralaryngeal muscles, especially the separators or abductors of the vocal cords, the cricoarytenoids posticus. This condition did not come on suddenly as in the nervous type and the patient usually left the table and returned to the ward breathing naturally, when four or five minutes after a spasm would occur which would necessitate reintubation. Again the spasm might be delayed for several hours or might come on during sleep. In both instances the dyspnea was inspiratory and accompanied by a loud stridor. 3. A type with marked polypoid outgrowth at the base of the epiglottis and the ventricular bands, which fell together as the pressure of the tube was released causing obstruction and necessitating immediate reintubation. Clinically this condition simulated the spasm type. Under general anesthesia these patients would breathe, though with difficulty. 4. The hypertrophic subglottic type in which the stenosis was slow and gradual accompanied by both inspiratory and expiratory dyspnea. In these cases reintubation was necessary sooner or later. The contraction usually occurred at the cricoid cartilage but it might involve the entire lumen of the larynx. These slow contracting hypertrophic types were exceedingly difficult to reintubate and one should never wait until grave stenosis supervenes. 5. The cicatrix type which was due to traumatic or surgical interference. This type might embrace the following classification: (a) Tracheotomy made imperative when it was impossible to intubate or when false passages had been made at the primary intubation. (b) Tracheotomy to save life in the persistent autoextubation stage or in the extreme grade of hypertrophic contraction. (c) Cicatrices resulting in chronic tracheal canulæ cases, accompanied by atresia of the disused larynx above the canula, and by polypoid hypertrophy about the canula and on the posterior wall. (d) Laryngotomies for the purpose of dissecting the hypertrophic connective tissue. 6. The atrophic type which occurred in a few cases which had recovered after long treatment but suffered with thick sticky mucocrusts which obstructed the larynx. In this type there was loss of voice and extreme dyspnea.

The basis for the whole pathology of this condition was laid down in the beginning with the acute diphtheritic exudate and the primary intubation. When the exudate resolved early the patient was able to remain without the tube on the first extuba-

tion. The tube virtually acted as a foreign body causing pressure on the laryngeal soft parts and as it rode up and down or anterior and posterior under the acts of coughing and swallowing ulcerations were produced which also added to the necessity for prolonged intubation. These pressure ulcerations were most marked at the cricoid cartilage and when of sufficient degree caused necrosis with absorption of the whole of the cricoid ring with the frightful sequelæ of persistent autoextubation. With the absorption of the cricoid cartilage the tube could no longer be held in place by the retention swell and was therefore autoextubated. The once firm cartilaginous larynx at the cricoid level was now converted into a collapsible tube. The recurrent laryngeal nerves showed no signs of pressure and a bilateral abductor and adductor paralysis of neural pressure origin however attractive in theory was not substantiated by fact. In fact, any involvement of the recurrent laryngeals due to diphtheria was extremely rare. This autoextubation stage was one of the most frequent causes of subacute and chronic cases and were it not for bronchopneumonia which usually carried off these patients the percentage of chronic stenosis would be considerably greater than 1 per cent.

The various types seldom occurred singly and all required prolonged intubation in order to bring about a cure. For the nervous and spasm type an extremely narrow neck tube should be used that would allow for a lumen, and it was a difficult matter to get a tube with an extremely narrow neck that would have sufficient lumen for the patient to breathe. Dr. Lynah said that he had devised another tube and had taken out the posterior portion below the head directly into the lumen; this enabled the patient to breathe and at the same time gave motion to the cords and gave the posterior cricoid arytenoids a chance to work by taking pressure off the muscle. When polypoid outgrowths were the cause of spasm this tube would have to be removed and a tube with a wider neck substituted to press out these mushy masses. A large head tube was also necessary. For the hypertrophic type gradual dilatation with special tubes measured in millimeters with increasing diameter should be used. The tube should dilate antero-posteriorly as well as laterally and the writer's tube of cigar-shape accomplished this purpose. It should not be forgotten that the hypertrophic type involved the entire lumen. These tubes were gradually increased in size until the largest possible dilatation was accomplished. In some cases this excessive dilatation would cause spasm. The treatment of the cicatrix type was also by dilatation though when the tracheal fistula was low a special tube with the greatest diameter from the retention swell downward should be used. When the case was one of chronic stenosis from long wearing of a tracheal canula and closure of the larynx above dilatation should be accomplished from the tracheal fistula upward by means of sounds and then a suitable dilating tube intro-

duced. Intubation in these cases was often difficult and as the tube entered the trachea it would ride over the obstruction and appear in the wound. To overcome this, firm pressure should be made on the intubation tube at the side of the fistula to mash out the posterior hypertrophy and allow the tube to pass the fistula into the trachea below. This tube should be a post tube which had a device which could be screwed into the tube to prevent its being dislodged during the act of coughing. The tracheal fistula should be cureted and all polypoid tissue removed, the edges scarified and the wound closed about the post. This tube should be worn for a month and then changed for a larger dilating tube. This tube with its bridge attachment could be used in doing a laryngotomy to dissect out the hypertrophic tissue; this operation, however, the author had abandoned as futile, for a pure cicatrix was added to the already complex pathology. He had had fairly good results with these cases, but owing to infection of these wounds the healing was usually by granulation. The atrophic type with the thick mucocrusts, after a cure had been effected, should be treated by intralaryngeal medication. Mandel's solution or iodine petrogen was useful or the internal administration of the iodides and steam inhalations. He had had cases which were intubated owing to this crusting and mucous obstruction which the patient was unable to cough out and in each instance he had been able to reintubate with a large dilating tube only to have this thick ropy, crusty mass coughed out through the lumen.

DISCUSSION.

DR. WILLIAM P. NORTHRUP said that he was present because he thought he was the oldest living intubationist. He was making autopsies at the Foundling Hospital at the time that Dr. O'Dwyer was perfecting his intubation tubes. They were at first bivalved and the next modification was shaped something like a chimney-pipe. When introduced not only do they hold but they were hard to get out. For fully five years Dr. O'Dwyer worked over his tubes, perfecting them, and during this same time he (Dr. Northrup) was making autopsies. The work was like confinement work, one could not get away. When once called to intubate you were bound to get there. Dr. O'Dwyer, Dr. Brown, and Dr. Northrup were the ones who were doing the work in those days. The first paper on this work in laryngeal stenosis was written by Dr O'Dwyer and he was asked to present it before the British Medical Association. He could not go but ordered Dr. Northrup to present his claims before the Queen and the British Medical Association. Dr. Northrup did so. That was the first paper of that character ever then printed. He said he had been greatly edified by the work of the reader of the paper and he felt that all appreciated his work in this particular line.

DR. JOHN ROGERS commended heartily the work that Dr. Lynah was doing along this line. Few men understood the cause and the treatment of stenosis of the larynx. A few years ago Dr. Rogers was very much interested in it. Cases turned up in which tracheotomy had been performed and many in which some of the best surgeons in the country considered as being hopeless. He thought that all these cases of stenosis could be cured by this treatment, and no case of stenosis of the larynx should be given up as hopeless. His experience with the use of the metal tubes led him to look upon them as being more or less dangerous, becoming coated with calcium material and practically occluding the tube. The time of treatment mentioned by Dr. Lynah, Dr. Rogers thought was rather short. To cure these fibrous strictures he thought an average period of at least two years was required.

DR. MATTHIAS NICOLL, JR., said: That he had had occasion to congratulate Dr. Lynah before this on the excellent work that he was doing in the alleviation and cure of these pitiful cases, and did so now with a greater pleasure since he had come to know the great difficulties which had surrounded the study of their pathology. It was obvious, from Dr. Lynah's paper that even when intubation was skillfully performed with proper instruments, the condition of chronic stenosis would occur in a small per cent. of the cases. What chance, then had a bungling operator to escape this condition? The city of New York was full of "half-baked" intubationists, for whose existence, the Medical schools were responsible. The usual course in intubation, consisting of a brief instruction in the general principles of the operation, and allowing each student to put a tube once or twice into the larynx of a cadaver distorted by previous effort and later extracting it. After a few months, the purchase of an intubation set equips the graduate as an expert, and the trouble begins. Would a teacher of diseases of the nose and throat consider his students, after having received the routine medical course and without special training, fitted to perform, for instance, catheterization of the eustachian tube or the genito-urinary teachers a catheterization of the ureters, and yet lack of skill in these two operations would ordinarily be followed by only a negative result, and some discomfort and waste of time for the patient, whereas, in the case of unskillful intubation, death not infrequently followed from inability to relieve the condition, or later, by reason of a false passage, or the patient crippled for life.

DR. O. DWYER frequently stated that it was infinitely better in an emergency to perform a tracheotomy than a bungling intubation. The would-be intubationist should have practised extensively, not only on the cadaver, but also in diphtheria cases, under the supervision of an experienced operator. Strange as it may seem, laryngologists rarely perform this operation by touch, and it is therefore left to the pediatricist with

special training. It is the duty of these men to see that the operation is properly taught to those who desire to become specialists in it, or not taught at all.

Finally, there is a great deal of ignorance among practitioners of the physical signs and symptoms, which accompany acute laryngeal stenosis. Dr. Nicoll had been called upon, as no doubt others have been to intubate cases of clearly defined bronchiopneumonia on several occasions, catarrhal croup and one case of meningitis. Pneumonia especially is without question frequently intubated in mistake for laryngeal diphtheria.

It may be of interest to know that it is not unusual at the Willard Parker Hospital to receive cases, which are said to have been intubated, the tube later passing through the bowels.

DISCUSSION.

DR. HENRY W. BERG congratulated Dr. Lynah upon the subject he had brought up for discussion. The vast majority of men in practice, even those who intubate, had not seen more than one or two chronic tube cases. The material at disposal at the Willard Parker Hospital must teach the profession how these cases should be treated.

In 1903, Dr. Berg had reported fourteen "chronic tube" cases in a monograph which discussed the causes and pathogenesis as well as the clinical features of such cases. It was interesting that of 578 cases then reported of intubation there had been 221 recoveries. Among these there were seventeen "chronic tube" cases, with seven recoveries and with seven deaths, and three discharged to other institutions. The length of time the tubes were worn in these chronic tube cases varied from two and a half to eighteen months. The tubes used were not modified, but were the O'Dwyer tubes. Thus almost 3 per cent. of all the cases intubated from December 1900, to April, 1903, became "chronic tube" cases. At that time he was particularly interested in the pathology of these cases, concerning which Dr. O'Dwyer gave very little information in his writings. He studied the cases with great care and found that there were practically two types of lesions due to the pressure of the tube, in cases that came to autopsy after laryngeal diphtheria with intubation. First, there were simple superficial ulcerations or decubitus sores: second, there were the deeper ulcerations, so deep as to go through the mucous membrane and sometimes even destroy the cartilage with abscesses of the surrounding soft structures.

The decubitus sores should be considered as the etiological factor because they kept up the edema, the swelling, and necessitated repeated intubations one after another. There was a very important condition that should be kept in mind in this connection, that of autoextubation of the tube; in some of these cases if the tube is not at once reinserted death from asphyxia would

follow. These cases should be carefully studied, because they are of a malignant type, and differ from cases of conservative type of autoextubation. Of the fourteen cases of chronic tubes, there were six autoextubation cases reported in the paper to which he had referred. It was a great problem what to do with these cases.

Dr. Berg believed that the dangerous type of autoextubation was often due to paralysis of the recurrent laryngeal nerve. The maximum number of cases of decubitus sores occurred in the mucous membrane on a level with the junction of the cricoid and the thyroid cartilage. In spite of the picture thrown upon the screen of apparently normal nerve trunk fibers, it should be remembered that a muscle could be deprived of motor power by neuritis of its muscular branches: interruption of the continuity of the nerve by destructive neuritis at a small point means degeneration and atrophy of that nerve beyond that point and that means paralysis of the muscles supplied. These tubes were kept from being coughed up by the contraction of the vocal cords around the neck of the tubes and the fact that the retention swell is larger than the neck of the tube. If there was a paralysis of even one cord only the tubes might be coughed up. The integrity of both vocal cords prevented autoextubation. Soon after the children coughed up the tube in these "malignant" autoextubations, the vocal cords flapped together and the patient suffocated unless the tube was immediately re-introduced. At the Willard Parker Hospital when such an autoextubation occurred in the tube Ward a bell was rung by the nurse and all physicians who heard it ran to the ward: the first there, at once reinserted the tube.

Dr. Berg could not imagine any spasm lasting eighteen months as a cause of chronic laryngeal stenosis. Spasm was not a cause of persistent intubation of the larynx at all in his opinion. Cases of laryngeal spasm might require two, three, four or even five intubations and then they got well. These Dr. Berg had termed prolonged intubations. The chronic tube cases were cases of autoextubation with paralysis of the vocal cords, and also such cases in which stricture of the larynx resulted from scar tissue formation after healing of these decubitus sores.

With regard to the treatment, there was one tube presented by Dr. Lynah which Dr. Berg would not like to attempt to push through the cricoid; the diameter of the tube below the retention swell was larger than it should be, and when used, there was danger of fracturing the cricoid cartilage and then, after the removal of the tube the cartilage would collapse. Some of the other tubes presented had some good, and some objectionable features. Dr. Berg praised the tube presented with the built up head, which would tend to raise the retention swell away from the decubitus sore, and thus promote the healing of the sore. He believed that every time they attempted to modify Dr. O'Dwyer's tubes they did so frequently to the disadvantage of the child.

Five years from now he thought Dr. Lynah would not use all of the tubes he presented, but would adhere closer to the Dr. O'Dwyer type of tubes.

DR. LOUIS FISCHER said that his two principal rules in intubation and extubation were: First, avoid force and thereby avoid injury. This rule had been of the greatest aid in preventing retained tubes. Second, do not hurry. While in a severe laryngeal stenosis, a given amount of haste was necessary in selecting the proper sized tube and making preparations, when it came to the introduction of the tube, the inflammatory process and subnormal condition should be remembered and hence the advice—go slow. The nervous and frightened child must be quieted when extubation was to be done. The speaker said that it was his rule to give an antispasmodic for twelve hours preceding the removal of the tube. Codein $\frac{1}{4}$ or $\frac{1}{3}$ grain should be given to a child two years of age or over, repeated every three hours for four doses, or 10 grain doses of sodium bromide with 2 grains of chloral hydrate repeated in six hours—two doses only would allay nervous excitability and have a quieting effect. The antispasmodic should be continued for twenty-four hours after the removal of the tube. The spasm due to fear of the operating table when repeated intubation and extubation was practiced, might, in rare cases, require the inhalation of a few drops of ethyl chloride prior to extubation. Dover's powder was also a valuable drug as an antispasmodic. Intralaryngeal medication consisted in applying a coating of medicated gelatin to each tube. Ten per cent. orthoform in gelatin or ichthyol gelatin had served well in a case of persistent tube reported seven years ago. Owing to the thickness of the coating of gelatine, a tube one size smaller than usual was required. Decubitus due to pressure of the tube or when caused by forcible in- or extubation, lent itself readily to this plan of treatment. That there was considerable danger in the abrasion of the mucous membrane was evidenced by the migration of the pathogenic bacteria into the deeper structures, frequently setting up peritracheal or perilaryngeal abscess.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Treatment of Intracranial Cerebral Hemorrhage in the New-born.—C. C. Simmons (*Bost. Med. and Surg. Jour.*, 1912, clxvi, 43) records two cases of intracranial cerebral hemorrhage of the new-born successfully operated upon. Few cases have been reported. Instead of turning back an osteoplastic flap, as recommended by Cushing, the writer simply incised the anterior fontanelle and coronal sutures and dura, and after allowing the effused blood to escape, closed the wounds with a small drain

inserted for the first day. Of this condition the symptoms are primarily those of cerebral pressure. In some cases the symptoms appear at once, the child becoming comatose soon after birth and dying in a few hours, while in others they do not appear till the third or fourth day. The first symptoms are irritative and consist of restlessness, crying and an inability to nurse. The child is pale and appears sick. Vomiting is rare. The fontanels are tense and do not pulsate, and the pulse is usually accelerated. Later there are more marked symptoms of compression with shallow respiration, which may be, however, unusually deep, increased blood pressure with a full rapid pulse, and cyanosis. Motor localizing symptoms may or may not be present, and consist of convulsive, irregular movements, general at first, later becoming localized to one side or limb, usually the leg, as this is the center most often pressed upon. If the hemorrhage is bilateral or the motor area not involved, localizing symptoms may be entirely lacking. The reflexes are increased.

Diabetes Mellitus in Children.—W. Gellhorn (*Northwest Med.*, 1912, iv, 12) says that every case of diabetes in childhood ought to be treated in the most careful way and as early as possible. In cases of the severest type, who do not yield to the most exhaustive and prolonged efforts to change them into milder forms, a dietetic treatment is not indicated. A sensible reduction of the carbohydrates in the food and general therapeutic measures will present our only means. Treatment of the suitable cases has to be strictly individualized. The treatment is less important in regard to prolongation of life than toward relief of symptoms. Oatmeal treatment is extremely useful in the management of diabetes in childhood. The urine of children, hereditarily predisposed ought to be examined at least once every month. A prophylactic restriction of the carbohydrates in these cases is advisable.

Omphalorrhagia Neonatorum.—J. H. Richards (*Med. Rec.*, Jan. 13, 1912) records a case of bleeding from the stump of the umbilical cord, nose and gums, with blood in stools and vomitus. Blood platelets were only 20,000 in number. Speedy recovery followed injections of 30 minims of the father's blood serum ever three hours for four days. The writer says that from the fact that the amount of serum needed to cure omphalorrhagia for all time is very small it would appear that the condition is due to a diminished production of plates, and that the production is increased permanently by the administration of serum. The serum in this case acts as an activator. What it is that causes this underproduction of blood plates has not been demonstrated.

The Diazo Reaction in Scarlet Fever (*Arch. Ped.*, 1912, xxix, 13).—The work was undertaken in order to determine whether the diazo reaction was of value in differentiating serum rashes from scarlet fever. From a study of 502 cases, Woody and Kolmer found that the diazo reaction was positive in 17.3 per

cent. of scarlet fever and 12.9 per cent. of diphtheria patients during the first week of these infections. It is during this week that the scarlatiniform serum rashes are more apt to appear and are difficult to diagnosticate from scarlatina. A much lower percentage of positive reactions were observed in serum sickness, averaging 10.8 per cent. for all cases examined, but some of these positive reactions may have been due to the previous diphtheritic infection. The value of the diazo reaction in differentiating serum rashes from scarlet fever is slight since a positive reaction is present in only a comparatively small percentage of scarlet fever cases. The reaction is positive in 75 per cent. of measles cases and a negative reaction in a case presenting a morbilliform rash would be of value in the differentiation of measles from serum sickness.

The Dietetic Treatment of Infantile Tetany (*Arch. Ped.*, 1912, xxix, 24).—Grulee obtained good results in infantile tetany by excluding the whey from the diet. He believes that the whey contains some material which acts in an irritating manner, producing an increase of the irritability of the peripheral nerves.

Purpura in Infective Diarrhea.—H. D. Rolleston and J. B. Molony (*Proc. Roy. Soc. Med.*, 1911, v, Sect. for Study of Diseases in Children, p. 54) have analyzed notes of 100 cases of acute infective diarrhea, finding that purpura occurred in eleven cases, all fatal. They say that symptomatic purpura in infective diarrhea mainly occurs on the abdomen and chest of infants under the age of one year. It is usually a terminal phenomenon in prolonged cases. The prognosis in these cases is extremely grave.

Congenital Flexion of the Proximal Interphalangeal Joints of the Fingers.—D. C. L. Fitzwilliams (*Proc. Roy. Soc. Med.*, 1911, v, Sect. for Study of Diseases in Children, p. 59) calls attention to the condition of congenital flexion of the proximal interphalangeal joint or hook-finger. This is always most marked in the little finger, which is flexed to a right angle at the first interphalangeal joint, and resists any attempt to extend it beyond, though freely movable within this limit. The metacarpophalangeal and distal interphalangeal joints nearly always show a compensatory hyperextension, so that the deformity resembles that of a hammer-toe acquired in later life. The deformity, if it affects the ring finger, is less marked, while the other fingers usually escape; in severe cases, however, all the fingers are affected, but in a lessening degree from the fifth to the second digit. The condition is almost always bilateral. It is a developmental error. When seen early the treatment of the deformity consists in stretching the anterior ligaments of the joint at fault by gentle and frequently repeated efforts at extension. If necessary to divide the ligament, it would be best affected by passing a fine-bladed tenotome into the joint from the side and detaching the ligament from the front of the base of the middle phalanx. This would not interfere with the insertion of the tendons in any way. The finger should then be kept straightened on a light splint.

Congenital Rickets.—Raoul Labbé (*Rev. mens. de gyn., d'obst. et de ped.*, January, 1912) finds that children are born which show evidences of a process which has gone on in the uterus, resulting in pathological changes in the bones and deformities exactly similar to the rickets seen in later child life. The height and weight are less than normal, the abdomen is large and flaccid, the thorax is narrow and deformed, there are swelling of several epiphyses, curvature of the long bones, and anomalies at the base of the skull. The epiphyseal swellings affect the ribs, clavicle, knees, and radius. Fractures of the bones occur. The distinction between fetal and congenital rickets seem purely hypothetical. Some of the bones are soft and friable, explaining the fractures; others are hard and compact with absence of medullary canal. To assign a cause is quite difficult. The general opinion seems to tend toward intoxications, and poisons, such as syphilis, and other toxi-infections. The cause has acted during intrauterine life and the child is born showing the pathological results. There are several similar conditions, such as achondroplasia and periosteal dysplasia, that need to be differentiated from this condition. It seems possible that we have in them only several degrees of the same process, as a result of greater or less virulence of the exciting cause, its longer duration, and greater intensity, combined with the resistance of the organism to its action. Mixed cases which show combinations of the different forms are not rare. One cause may be hereditary predisposition; another may be twin pregnancy; others are acute or chronic infections.

Nasal Diphtheria.—C. F. Burrows (*N. Y. State Jour. Med.* 1912, xii, 36) states that nasal diphtheria is a common single affliction, also a frequent complication of scarlet fever and other contagious illnesses. The symptoms of nasal diphtheria are a bloody, or blood tinged, ichorous, serous discharge accompanied by crusting and excoriation of the septum, nasal apertures and sometimes of the upper lip. There may be in some instances a visible membrane somewhere in the nares. Itching is also a manifestation. These symptoms may be present in both nostrils or one. Occasionally the only observable early sign is the blowing of bloody mucus from the nose, the hawking of it from the naso-pharynx, or a trifling nose bleed. The majority of the cases of nasal diphtheria are subacute and located in the anterior part of the nasal passages. The disorder does not seem to confer an immunity against a sudden extension of a severe diphtheria to the throat or larynx. A large number of pharyngeal and laryngeal cases of diphtheria are accompanied in a quiescent way with the nasal form also, and every case of diphtheria of the throat or larynx should not be released from quarantine until at least two cultures of the nose have been reported negative. A 3000 unit immunizing dose of antitoxin is uncertain as a preventive and it protects probably only about 50 per cent. of those injected from acquiring diphtheria if closely exposed. It may be that its seeming failure is due to the fact that the case when injected

already has diphtheria and that 3000 units is not a sufficient dose for its cure. Every case of nasal disturbance in childhood, and even in adult life, should be cultured as carefully as we now culture suspicious disturbances lower down. This rule especially should be observed in scarlet fever, measles and other contagions. Every case of scarlet fever and measles presenting any of the symptoms characteristic of nasal diphtheria should be cultured, each nostril separately, and this procedure should be repeated several times. While this is being done, such cases should be segregated from others not so afflicted and treated on the assumption that they are positive nasal diphtheria irrespective of culture returns.

Treatment of Residual Paralysis of Anterior Poliomyelitis.—

B. Bartow and W. W. Plummer (*Buff. Med. Jour.*, 1912, lxxvii, 310) favor the replacement of weak ligaments with artificial ligaments of silk. The material employed for the artificial ligament was the parafined silk tendon, prepared in the manner suggested by Lange for tendon elongation. Number 20 Corticelli twisted silk was the size used for both knee and ankle in the earlier operations. Its tensile strength, after operation, was roughly estimated to be sufficient to sustain a direct strain of 125 pounds. For the fixation of the feet in very young children, number 14 size is used with satisfactory effect, and greater ease of introduction. The writers describe the method of inserting the artificial ligament. No tendency has thus far been shown for the silk ligaments to cut their way out of the joint, or cause sloughing of the tissues in contact with them. They become looser, however, with time and the use of the limb. As they cannot stretch, the chief source of looseness is probably from absorption of the bone in which they are buried at points where tension is greatest.

Fractures and Separation of the Epiphysis in Children.—

Savariaud (*Jour. de méd. de Paris*, Feb. 10, 1912) says that one can observe in some infants evidences of the union of intrauterine fractures. Rachitis constitutes a frequent cause of fracture, by weakening the bones. Prolonged immobilization of the limbs causes an intense decalcification of the bones which is another predisposing cause of fracture. Subcondyloid fracture and separation of the epiphysis of the femur are somewhat frequent after the removal of apparatus used for congenital luxation of the hip. Incomplete fractures are frequent in young children and unite readily, being healed in three weeks or so. Sometimes only one face of the bone is fractured, the other side remaining whole. This causes the ability of the child to use its fractured arm or leg after the fracture has occurred, and in some cases the fracture is not detected until a callus forms. In these cases the periosteum is preserved intact. Displacements are less frequent and severe than in the adult. Muscular secondary displacement is rare in the child. Crepitation is of two kinds, osseous and cartilaginous, the latter being softer. Luxation is much less frequent in the child than fracture. Radiography may be

necessary to make a correct diagnosis. Fractures, except in the rachitic, unite with great rapidity, and a large callus will result from displacement which is insufficiently reduced. Normally there exists at the point of union of the cartilage of growth of the diaphysis a zone of imperfect ossification which is a point of least resistance. It is at this point that separation of the epiphysis takes place. These are observed especially in the femur, humerus, radius, and tibia. They may be recognized by the violent distortion of the ligament, or by the direct shock. The periosteum separated from the diaphysis remains adherent to the cartilage; this periosteal band ossifies very quickly and prevents reduction. In treatment an exact apposition of the fragments must be obtained in order to avoid arrest of development, and formation of a vicious callus.

Essential Scoliosis of the Young and its Treatment.—Ed. Laval (*Bull. de la thérap.*, Jan. 8, 1912) says that the parent does not usually recognize, until informed by the dressmaker, that the child has one shoulder higher than the other and one hip more prominent, that there exists a rotary-lateral curvature of the spine which needs treatment. The scapula project in the beginning of this lesion. The line of apophyses of the spinous processes is curved, generally with a convexity toward the right and concavity to the left. There are three degrees of curvature; relatively recent curvature to the right or left, dorsal or lumbar; double curvature, in opposite directions; and persistent tripple curvature, which cannot be reduced. Treatment to be effective must be given in the first stage and here is generally successful. Prophylactic treatment consists in preventing vicious postures in children; not allowing them to walk too early or to take exercises which cause a too frequent and long use of one limb; not carrying the child always on one arm; special school furniture with high support for the back, and a high desk for the books; correction of ocular refraction; not allowing the use of a bicycle too high for the individual, etc. Curative treatment must include carefully supervised gymnastics for the development of the defective muscles. At these the physician should be present himself lest the exercises be given badly, insufficiently, or not at all. They consist of respiratory gymnastics, active and passive exercises involving the spinal muscles, etc. Muscular massage and friction with alcohol is useful. All violent games should be forbidden. The use of a carefully fitted corset, which grasps the child about the iliac crests and has a support under the axillæ is indispensable. The best is a well fitting plaster jacket. In the curvatures of the second degree rest in a hard bed for a good part of the day is necessary, and the child cannot go to school. For this, special exercises are also given.

Injuries to the Elbow in Childhood.—W. S. Lawrence (*Surg., Gyn., Obst.*, 1912, xiv, 91) says that the osseous structure of a child's elbow-joint differs very materially from that of the adult. Epiphyseal separation practically never takes place at this joint.

A very large percentage of all serious injuries to the child's elbow-joint are fractures of the humerus through the olecranon fossa. The best position in which to put up this fracture is that of extreme flexion.

Treatment of Harelip.—T. W. Brophy (*Surg., Gyn., Obst.*, 1912, xiv, 65) describes a device for holding the parts in contact after operation for harelip and for relieving tension on the sutures. Strips of adhesive plaster are cut broad in front of the ears and narrowed down as they approach the center of the lip. They are lapped over and doubled at the lip end, and the smallest size of dressmaker's hooks are sewed through the adhesive strip. One strip is placed on each side and then silk sutures are carried from the hooks on one side to the corresponding hooks on the other side, across over the lip. The tissues on each side of the lip are carried toward the median line, the lip is thereby pouted outward; all tension is removed from the tissues, and then the lacing from one hook to another, by means of silk sutures, holds the parts steadily and quietly in position. Should the silk which is carried from one side to the other, make an impression upon the tissues in the median line, this can be relieved by passing a small roll of gauze beneath the lip end of the adhesive strip and beneath the hooks. Coaptation sutures of horse-hair are employed.

Management of Inguinal Hernia in Children.—W. F. Campbell (*Med. Rec.*, 1912, lxxxi, 111) says that after the age of two years, if the hernia still persists, the truss should be abandoned and a radical cure performed because: 1. The chances of cure steadily diminish up to the age of puberty. 2. Truss pressure causes atrophy of the underlying muscles,, thereby diminishing the protection afforded by the muscles, and lessening the chances of radical cure. 3. The wearing of a truss interferes with proper exercise and thus interferes with bodily development. The child who wears a truss is handicapped in the struggle for existence. 4. The cures by truss are often apparent, not permanent. There are many recurrences. 5. Radical operation removes at once the serious handicap with all its disagreeable sequelæ by establishing normal conditions. 6. With the age limitation mentioned above it is the author's experience that the younger the child the more satisfactory the results of operation.

Vaccine Therapy of Tuberculous Joint Disease in Children.—A. B. Harris (*Proc. Roy. Soc. Med.*, 1912, v, Sect. Study Dis. Child., 84) says that the infection is often of bovine origin, and occurs through the alimentary canal, the infecting food being usually milk. Among the working class, environment, as well as food, is an all-important factor. The occurrence of auto-inoculations, as evidenced by the fluctuations of the opsonic index, is a valuable guide not only to diagnosis but also to the determination of whether or no a cure has been effected. Apart from this it is not necessary to employ the opsonic index during

the whole course of treatment, provided that the case, clinically, is pursuing a favorable course. Tuberculin, given in small doses, under conditions of surgical rest, is a remedy which tends to accelerate the rate of recovery. Children have a naturally recuperative power, which apparently is called out by the use of a bacterial vaccine in certain cases which do not automatically respond to surgical rest, and improved environment.

Indications for Surgical Interference in Tuberculous Joint Disease in Children.—A. H. Tubby (*Lancet*, Jan. 6, 1912) says that the objects of every form of treatment of tuberculous arthritis must be: (1) To eradicate the disease; (2) to preserve the functions of the part; and the question is whether these results are more frequently obtained by climatic and conservative measures or by so-called radical operations. The balance of experience gained in treatment during the last decade shows that unquestionably conservative treatment is the better in childhood. Time is saved, the resultant deformity is diminished, and there is less risk of generalized tuberculosis when the treatment is non-operative. As regards the treatment of tuberculous abscesses, if the pus is deeply placed, and if the patient is placed at rest in good air, the fluid contents are sometimes absorbed, and the caseous matter becomes encapsuled. If, however, in spite of these measures the abscess increases in size its sac should neither be allowed to become adherent to the skin nor to open spontaneously, as an opening often forms in an undesirable position and is liable to septic infection. When pus continually reforms it is generally due to the extension of bone disease or to loose sequestra, which can be ascertained by means of Roentgen rays. Then the abscess is opened invariably by more than one incision, so as to permit free access to the cavity and allow the pockets to empty. The fluid contents and the sequestra are removed without any violent scraping of the sac wall, which should be merely rubbed with a soft swab. Pure carbolic is then applied and left in for about a minute and washed out with absolute alcohol. The cavity is then dried and closed immediately so as to obtain primary union. If a little fluid accumulates subsequently beneath one of the wounds, a sterilized probe is inserted, the fluid pressed out and the wound allowed to heal. It is doubtful whether operative results are better in cases of tuberculosis of the hip-joint than those obtained by rest and splints. The safest course in tuberculosis of the knee-joint is to give a long and patient trial to conservative treatment, and, if this fails, to give up all hopes of a movable joint and do a formal excision, having regard to the epiphyseal lines, and endeavor to secure sound bony ankylosis and a straight limb. Even in dealing with the ankle and foot, statistics show the best results to be obtained by rest and conservative treatment. The joints of the upper extremity present problems differing from those of the lower. Whereas the chief functions of the lower limbs are stability and weight-carrying, those of the upper extremity consist of highly educated move-

ments and the importance of preserving them is undisputed. Operative interference, if it is likely to have the desired object, may therefore be considered at an earlier date than in the lower extremity. In children, however, erosion frequently proves to be better than a formal excision when conservative treatment has failed. Tuberculous arthritis of the shoulder is frequently followed by pulmonary tuberculosis, so eradication of the disease in this joint may be attempted at an earlier stage than elsewhere.

Infantilism.—Mathilde de Biehler (*Arch. de. méd. des. enf.*, Jan., 1912) says that infantilism is a disease of development marked by the persistence of childish characteristics in a person who has passed the age of infancy, with retarded physical and psychical development. There are two types of infantilism. In the type of Lorain we have a man in miniature, with enlarged thorax, and small pelvis, and no disproportion between the head and the rest of the body; the hairy system and the genital organs are undeveloped. A man thirty years of age will appear like a boy of twelve to eighteen. There are lesions of the heart and vessels, of the eye and thyroid. The nervous system is not well developed, and there may be chorea, hysteria, epilepsy, and neuroses. In the Brissaud type there are added symptoms due to the insufficiency of the thyroid and hypertrophy of the hypophysis and thymus. This form has been called congenital myxedema, and radioscopy shows an arrest of development of the epiphyses with retardation of ossification. There are the usual myxedematous changes in the skin. Myxedematous infantilism is due to thyroid insufficiency. Apparently the gland manufactures a substance necessary to development and its absence limits the development. In the Lorain type the causes mentioned are angioplasia, alcoholism, tuberculosis, bad hygienic conditions, insufficiency of the suprarenal glands, syphilis, and malaria. Testicular insufficiency causes gigantism; thyroid insufficiency causes dwarfing of the stature. If testicular insufficiency occurs in adult life it causes acromegaly; in youth, gigantism and acromegaly; in childhood, gigantism alone. Testicular insufficiency may be caused by congenital anomalies, anorchidism, and cryptorchidism. It may be acquired from injury, from mumps causing orchitis, or from syphilitic orchitis. Absence of development of the thyroid causes nondevelopment of the testicle in infantilism. In the adult it may occur as a result of testicular and thyroid disease combined, and with these is also found hypophyseal disease. In myxinfantilism there are bony changes; in dystrophic infantilism the ossification is normal. Contraction of the thorax and pelvis is accompanied by arrest of development of the contained organs. In acquired infantilism we can only educate the children, nourish them, and assure their moral and physical development. Apparently in many cases there is insufficiency of several glands.

Treatment of Backward Children by Associated Glandular Extracts.—Raoul Dypuy (*Jour. de méd. de Paris*, Feb. 3, 1912) says that in some cases of backward children he has obtained the best of results by making use of a combination of the extracts of the several glands of internal secretion. At autopsy we may find in these children persistence of the thyroid, multilobed kidneys, atrophy of the glands of internal secretion, and changes in the spleen and liver. This condition of backwardness of development arises from conditions in the parents such as alcoholism, syphilis, tuberculosis, malaria, arthritism, and acute and chronic infections in pregnancy; overwork in the parents, privations, and bad hygiene of the pregnant mother. Other causes are bad feeding, premature birth, and infantile maladies. Thyroid medication alone is insufficient or injurious. If we associate with it the extracts of hyppophysis, suprarenals, and genital glands we shall get better results. This treatment will result in an increase in height, and in weight, increase of arterial pressure, urinary elimination, and metabolism, disappearance of morbid phenomena of the sympathetic nervous system, enuresis, hernia, etc., appearance of the signs of puberty, and psychic and sensorial development.

Misunderstood Dangers of Pertussis and Tuberculosis.—Rousseau-Saint-Philippe (*Jour. de méd. de Paris*, Jan. 6, 1912) insists upon the dangers of whooping-cough and the liability to infection with the bacillus of Koch which it leaves behind it. It is a misapprehension that this disease is slight and that we must wait until the child whoops before separating him from other children. There are many cases in which the child never whoops, and yet in which the disease lasts for months, while the child spreads it wherever he goes. The diagnosis should be made by the obstinate spasmodic cough, with vomiting, running of the nose and eyes, expectoration and fever. There are many abortive cases and many that are complicated with a bronchitis which continues for months. The whoop is absent in one out of every six cases. The examination of the blood will show a marked leukocytosis, and the microorganism may be found in the sputum, as described by Bordet and Gengou. If the diagnosis is made early it may enable us to prevent the complications of the disease, bronchopneumonia and capillary bronchitis. Children who cough severely should be separated from others when attending dispensaries. Many neglected cases succumb to tuberculosis and some adults show a bronchitis with dilations that arose from whooping-cough neglected in childhood.

DISEASES OF CHILDREN.

Subcutaneous Cellular Tissue in the Defense of the Organism of the Infant.—E. Maillet (*Prog. méd.*, Feb. 17, 1912) says that the subcutaneous connective tissue by its suppleness assures the perfect function of the vessels and nerves, and helps to maintain

the integrity of the vascular and nervous systems. In the form of fat it becomes a regulator of the activity of the organism, a magazine of nutritive reserves, and lessens the loss of body heat. All its elements have a part to play in the general nutrition and defense against disease. When this tissue is disturbed in its functions various forms of disease result. It is in the connective tissue especially that the results of inflammation are seen—hyperemia, vasodilation, diapedesis, and proliferation of the cellular elements. In the child the thinness of the skin renders it a feeble means of defense. The fat is renewed and utilized continually in nutrition, forming a store house of food. The lymphatic spaces and vessels are larger than in the adult. The subcutaneous cellular tissue contains the terminal nerve filaments and excites the reflexes of protection. Hypertrophy of the elements of the cellular tissue may result in the obesity which is connected with hereditary arthritism. If the lymphatic elements are also hypertrophied the children are lymphatic, with soft, flaccid tissues, the seat of white edema, slowed circulation, and dilated blood-vessels. There is defective nutrition and assimilation of fats. In hypertrophy of the connective tissue, on the other hand, one sees atrophy, vasomotor troubles, localized and generalized edemas, which make the child an easy prey to infections. These children are cold. Sclerema causes an atrophy of the fats and thickening of the connective tissue fibers, with hardening of the skin.

Dangers and Detriments Due to Menthol.—Robert Leroux (*Presse méd.*, Feb. 7, 1912) warns against the use of solutions of menthol in the nares of young children who have obstruction due to acute coryza. He has seen several instances in which its application to the anterior nares before it had penetrated the nostrils and been absorbed caused the most violent dyspnea, which required artificial respiration for a long time to overcome it. Other authors have reported similar cases. It causes a very intense reflex inhibitory spasm of the bronchial tubes. It also causes much pain, acute conjunctivitis, pseudoerysipelas of the face, pharyngeal cough, reflex otalgia, and ringing in the ears. When used for chronic troubles it causes labial and nasal erythema, and thickening of the nasal mucosa, which results in obstruction. The author considers menthol a drug to be very carefully used, especially in children, since it is dangerous and sometimes even fatal in its effects.

Pneumococcic Infections.—Hutinel (*Bull. méd.*, Feb. 3, 1912) says that in pneumonia, a good prognosis should not be given until it is certain that there are no complications due to the localization of the pneumococcus in other parts of the body than the lungs, such as the pleura, peritoneum, brain, etc. Pneumonia is often truly septicemic. Crops of herpetic vesicles about the mouth often herald pneumonia; purpura may be present; cutaneous gangrene has also occurred. Phlegmonous abscesses are seen, and suppurative arthritis in which the pneumococcus is

found in the pus from the joint. Pleurisy becoming purulent, vegetative endocarditis, pericarditis, and nephritis are not infrequent. The icterus that occurs shows that the poison may be localized in the liver as well. Purulent otitis may lead the germs into the brain cavity and cause pneumococcic encephalitis, and purulent meningitis. Lumbar puncture will here clear up the diagnosis. The peritoneum may also be the seat of the infection, taking a very grave and septic form. Pneumonia in children is not at all a benign affection, since the agent may attack any one of the other organs or several at the same time.

Scleredema in the New-born.—E. Geiser (*Monatsschrift für Geburtshilfe und Gynäkologie*, January, 1912) in discussing this condition describes a series of eight institutional cases personally observed within a period of nine months. In speculating as to the etiology of this condition he states that in one of the cases an albuminuria was present, and in three others the mother was afflicted with a nephritis at the time of labor. The writer believes that it may be possible that in some unknown manner toxic substances in cases of nephritis are transmitted through the placenta which cause alterations in the kidneys of the infant. In another case the mother was afflicted with a myxedema. It was also noted that premature infants with congenital heart lesions or children not kept sufficiently warm were liable to become affected with scleredema. Undoubtedly the diminution of the body temperature in weak and premature infants exerts some alterative effect on the composition of the body fat so that the latter becomes hardened and in this way interferes with the circulation of the body fluids. For this reason, all weak and premature infants should be kept sufficiently warm and the nutrition kept up by frequent forced feedings of mother's milk.

Physiology and Care of the New-born.—R. T. Jaschke (*Monatsschrift für Geburtshilfe und Gynäkologie*, January, 1912) calls attention to the need of a more careful supervision by the obstetrician of the new-born infant, for in only comparatively few maternity hospitals in this done. This also applies to the instruction of students, who as a general thing are not sufficiently well informed in this field. Aside from the nutrition of the new-born infant there are other conditions which must be looked into, among which the most important should be concerned with asepsis precautions in the care of the nursing babies. The writer summarizes his instructions as follows. Everything which comes in contact with the lochia or the stools of the parturient woman is an element of danger to the child, and contamination by this means applies particularly to the hands of the nurse, as well as to those of the mother. Autoinfection of the infant through the medium of its own intestinal bacteria, to which others may be added in the stools, is also to be avoided. In maternity hospitals this requires a complete separation of the wards for the babies and the parturient women. The writer does not look upon the two-hour nursing period as physio-

logical, because the stomach of the new-born has been found not to empty itself until the lapse of from one and a half to two hours. He regards a three or four hour period, with a night interval of from six to eight hours as much more satisfactory. This is also claimed to have a better effect on the mother's breasts, as they are more completely emptied at each nursing. In the author's experience, the best results as regards a tying off of the cord were obtained with a ligature of strong silk, applied after the initial ligature done at the time of birth and not until the child has been bathed. He has entirely discarded the ordinary abdominal bandage for the infant and substitutes for it the so-called apron bandage devised by Flick. As a local application to facilitate the drying of the cord, the author has had good results with sterilized dermatol.

Fetal Hydrops.—O. Fischer (*Zeitschrift für Geburtshülfe und Gynäkologie*, vol. lxix, No. 3) calls attention to the association of fetal hydrops with umbilical hernia, which leads him to suggest that the hydrops is possibly caused by a purely mechanical interference with the circulation in the region of the hernia. In the case of fetal hydrops which he reports, a microscopical examination of transverse sections through an umbilical hernia showed that near the tip of the sac a loop of gut was adherent, and this showed a marked congestion present in the capillaries and veins and also a distinct small cell infiltration. In places this congestion had resulted in separating the epithelium of the intestine and produced a hemorrhage into the lumen of the gut. The periphery of the section also showed a connective tissue structure, the elements of which were separated by an edema, which tissue seemed to be part of the cord and gave evidences of having become necrotic. This necrosis likewise involved the Wharton's jelly. The placenta in this case also showed a well developed hydrops. Both parents were in excellent health, likewise another child, born three years previously. There were no evidences of specific infection in any members of the family or in the fetus. The fetus also failed to show any evidence of nephritis or any disease of the blood or the blood forming organs. The author is inclined to attribute the condition in this case not only to the hernial compression but to the abnormally short cord.

Lacerations of the Tentorium During Labor.—R. Pott (*Zeitschrift für Geburtshülfe und Gynäkologie*, vol. lxix, No. 3) refers to the frequency of intracranial hemorrhage in the new-born from lacerations of the tentorium and the consequences of this process in later life. His study is based on a series of thirty-three cases, as the result of which he presents the following conclusions. It was found that in autopsies on children up to six months of age, that traces of dural hemorrhage were present in an equal number to those found soon after birth, so that the percentage of such hemorrhages following lacerations is a considerable one. Lacerations of the tentorium manifest them-

selves in three different forms. The most common variety consists of a transverse tear of the free edge which usually involves the middle portion and in many cases both layers are torn. The hemorrhage in such cases dates from the numerous small veins which are present on the edge of the tentorium and the blood finds its way forward into the temporal fossa or upward over the occipital region. In a few cases it penetrates beneath the tentorium, surrounds the cerebellum and finds its way down along the medulla and the spinal canal. Less marked injuries involve the upper portion of the tentorium and the falx cerebri between the two leaves. In about sixty per cent of the author's cases the labor was very difficult, the majority being operative deliveries. In contrast to this the remaining deliveries were normal and in some cases very rapid. In seven cases such lacerations were noted in premature infants and one in a four months' fetus. It is quite evident therefore, that in every labor the possibility of this accident is present and is only slightly increased in severe labors. Pott believes that the stretching of the falx cerebri in the long axis of the skull predisposes to hemorrhage from a laceration of the tentorium, which may be brought about by lateral pressure on the temporal regions. It is probable that if this stretching takes place gradually the escape of blood occurs very slowly and produces comparatively little pressure. Therefore in many cases no evident symptoms whatever may result, but if for some reason or other, a congestion is present, then the hemorrhage is increased in amount depending on the size of the torn veins or the degree of the congestion. If extensive bleeding has occurred at the time that labor is completed, the resulting asphyxia produced by pressure on the medulla simply increases the amount of hemorrhage owing to the congestion present. Where death does not result in these cases, the laceration of the tentorium may heal spontaneously so that in two or three weeks after birth, scarcely a trace of the injury remains. The writer also refers to the possibility of an injury to the tentorium occurring after labor by a forcible compression of the child's head from extraneous causes.

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ORIGINAL COMMUNICATIONS.

A CLINICAL STUDY OF THE OPERATIVE FINDINGS AT SECONDARY OPERATION.*

BY

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It is with a feeling of great hesitancy that I appear before you, a body of skilled gynecic surgeons, to present these few desultory remarks upon some of the unfortunate results consequent upon pelvic surgery; yet the number of patients who have applied to me, seeking relief during the past five years, who have been previously operated upon for pelvic or abdominal conditions, is so large that we have come to the conclusion that there is frequently an error in diagnosis, technic or judgment on the part of the surgeon at the primary operation.

Of the 139 women who form the basis of this study, forty-two have been previously operated upon by the writer, while the remaining ninety-one are the products of other surgeons.

The living pathology in these cases, as it was observed by me on re-opening the abdomen, is my excuse for the deductions here presented. The surgeon, in order to accomplish a gynecological cure, must first of all attempt to restore the normal anatomical relations which existed or which should exist between the adjacent structures in the pelvis prior to injury, inflammation, or the advent of new-growths. In doing this, whether the surgery be reconstructive or ablative, we must constantly keep in mind the

* Read by Invitation before the Society of Alumni of the Woman's Hospital Feb. 27, 1912.

natural processes by which nature accomplishes this repair. These cases may be grouped in the following classes:

First, where an incomplete operation has been done or an incomplete diagnosis made.

Second, where bad judgment was shown in the selection of the primary operation.

Third, where conservation of an ovary or ovaries has been done, and the retained organ has become the site of chronic inflammatory and cystic changes.

Fourth, where conservative operations on the tubes have been employed.

Fifth, where abdominal drainage has been used with resulting ventral hernia.

Sixth, where a poor or hasty toilet of the peritoneum has been made.

Seventh, where troublesome visceral adhesions have occurred, even though a proper and careful technic has been followed, and finally, that group of patients who remain unrelieved, owing to an improper or neglectful after treatment.

In the first group we must consider the work done by the occasional operator, or the general surgeon, in his excursions into the field of gynecology. The man who suspends a uterus without restoring the cervix, or the woman's pelvic floor, or who takes out an appendix in a woman, without exploration of the pelvis, or who takes out a single tube in a gonorrheal or tubercular salpingitis, or who fails to clear the pelvis of sigmoidal adhesions, or who after removing both tubes, and consequently shortening the broad ligaments, omits to hold the uterus forward by suspension, or some round ligament operation, or fails to remove an appendix pointing south, when he has taken out the right tube and ovary, and has thus interfered with the appendicular circulation, or fails to examine the cecum for pericecal adhesions, and the right kidney and gall-bladder, or the broad ligament for varicosities in right-sided abdominal pain.

In this class there have been twenty-seven cases. Three presented a long peritoneal band at the site of the previous suspension, which allowed the uterus to fall back in the pelvis. A restoration of the pelvic floor, amputation of the cervix, and a Webster-Baldy operation has restored these women to perfect health.

Eleven had had their tubes removed, without any effort on the part of the surgeon to retain the uterus in a forward position.

In these we found the uterus retroverted and retroflexed. The ovaries which were attached close to the cornua were carried down with the descending fundus, and there were more or less intestinal and omental adhesions present in the vesicouterine space. Freeing of the uterus, ovaries and the pelvic peritoneum from their adhesions, and strongly anteverting the uterus by a posterior suspension, has changed these women's invalidism into health.

Four applied for the relief of persistent right inguinal pain following operation, and presented on abdominal incision omental adhesions to the stump of the right tube, an angulated appendix, and pericecal bands, the relief of which, with the removal of the appendix, gave the desired result.

Six had had one tube removed, four for a gonorrheal, and two for a tubercular infection. The remaining tube had become the focus from which repeated attacks of peritoneal inflammation had arisen. A gonorrhea which has passed through the uterus into the tubes, always leaves some bilateral involvement. Removal of the remaining tube with suspension of the uterus has relieved these patients.

Four women presented themselves, complaining of persistent pain in the left lower abdominal quadrant, who on reopening the abdomen, showed a fixed sigmoid, due to adhesions to the stump of a previous oophorectomy, and the posterior surface of the broad ligament. Freeing of these adhesions, covering the raw surfaces with peritoneum, holding the sigmoid out of the pelvis by the injection of normal salt solution, with the patient in the Trendelenberg posture, and the maintenance of the patient in this position for the first forty-eight hours after operation, has resulted in a satisfactory recovery and relief of pain.

One patient complained of the same pain from which she had suffered prior to her primary operation (the removal of a chronic appendix), which had been made some six weeks before coming under our observation. On reopening the abdomen an ovarian cyst, the size of an orange, with a twisted pedicle, was found incarcerated in the pelvis, firmly adherent, pushing the uterus forward and to the left. The removal of the tumor relieved her pain.

Under the second heading, where bad judgment was used in the selection of the primary operation, re-operation has disclosed multiple fibromatous growths of the uterus fourteen times.

These tumors were of the hard encapsulated variety, and located in the body of the uterus.

In tracing back the histories of these patients, all of whom, with two exceptions, were previously operated by myself, it has been interesting to note that they were apparently ideal cases for myomectomy, presenting at the time of operation from two to five distinct, well-defined subserous or interstitial growths. All were in comparatively young women.

This observation has caused me of late years to limit myomectomy to subserous fundal growths, with narrow bases, or single submucous growths, with a more or less well-defined pedicle in the body or near the fundus, for not only is myomectomy a more dangerous operation than hysterectomy, when dealing with interstitial growths, encroaching upon the endometrium, owing to the circulatory changes which occur in the heart, blood and blood-vessels, making sepsis, hemorrhage, thrombosis and embolism more liable to occur, but we have noted clinically that the disturbance of the uterine circulation, subsequent to the enucleation of a fibroid growth, and the inflammatory changes which necessarily take place in the uterine musculature during the process of repair, stimulate quiescent fibroids resting in an intramural location, to further growth, just as pregnancy supplies the necessary circulation for the rapid development of a fibroid nodule. This is particularly true when the growth is situated in the body of the uterus, between the ovarian and uterine arteries. Another interesting observation has been made, *i.e.*, that if these women become pregnant shortly after myomectomy, further fibrosis seems to be checked, while on the other hand, if they are not so fortunate, sterility continues and other tumors are likely to develop.

It has been noted that interstitial fibroids near the fundus not infrequently obstruct the course of the intramural portion of the tubes, making the tube more tortuous and diminishing its lumen, thus obstructing the passage of the ovum in its descent through the oviduct. Two tubal pregnancies of which I have records were immediately due to this obstruction.

In six women another instance of bad judgment was shown in the retention of an infected uterus, after the tubes and ovaries had been removed, or the retention of an infected cervical stump, when a supracervical hysterectomy has been done for chronic bilateral inflammation. This has been the cause of more or less persistent metrorrhagia, or annoying leukorrheal discharge,

which has compelled the patient to seek relief by secondary operation.

The masterly paper of Hyde has shown us that recurrent attacks of vaginitis and urethritis develop, that the suspended uterus frequently remains subinvolted and tends to prolapse and may become incarcerated and adherent in the pelvis. That backache is more constant, that convalescence is more complicated, and that the retention of this useless organ, when its functioning power has been removed, is a menace to the woman's health, rather than an advantage, not to speak of the possibility of degenerative and fibroidal changes which may take place within it.

The lesson learned from these observations has been:

First, to always remove the uterus in double adnexal disease, when such disease is sufficient to demand total ablation of the appendages.

Second, that when this step is taken we should operate in such a way as to remove the entire endometrium of the cervix.

You may ask, Why do I retain the cervix at all? Because of the advantage of retaining an anchorage for the uterosacral ligaments, to which we can attach the round and broad ligament stumps, and so overcome the tendency to prolapse.

Many of these women have suffered injury of the vulvovaginal orifice, and a perineoplasty, because of the time consumed, often cannot be done at the same sitting. We have found that retention of this stump in a high position overcomes the cystocele. It does not, however, have any effect on, or diminish the amount of rectocele present, which can only be corrected by re-establishing the relation of the levators to the rectal wall.

The third class is where conservation of the ovaries has been attempted, and the retained organ has become the seat of chronic inflammatory and cystic changes, and this includes the largest number of uncured patients seeking relief. Fifty-one have applied for reoperation.

The abdominal findings have been more or less consistent. The conserved ovary has presented further cystic changes, more or less completely involving the entire structure, always attended by a low type of thin peritoneal adhesions, most difficult to handle.

In some patients it is surprising to note how soon after the primary operation cystic changes may occur. In one patient, where resection of an ovary had been made, who was reoper-

ated three days later, for intestinal obstruction, we were amazed to find that a thin-walled cyst the size of a lemon, which necessitated its removal, had developed in the conserved ovary. On examination it was shown that this cyst had developed from a deep-seated follicle, in which the efferent vessel had been occluded by the insertion of the ovarian suture.

It is our custom only to attempt to conserve such ovaries as are the seat of monocular cysts, fibromyomatous or dermoid changes, when they present a definite healthy hilum after the enucleation of the tumor.

It may be mentioned that in our experience the adhesions associated with thin-walled ovarian cysts, which have formed upon a resected ovary, are dense and extensive. It would appear that nature attempts to isolate the conserved portion of the ovary by an adhesive peritonitis. The sigmoid and omentum are particularly prone to become attached to the suture line.

Patients who have been subjected to an ovarian resection and in whom adhesive inflammation has followed have either presented a gradually developing amenorrhea or a persistent metrorrhagia, often uncontrollable by means other than hysterectomy; I therefore take the position which I maintained in a paper before the American Medical Association in 1909, in which I stated that multiple cystic degeneration was the least favorable to conservative procedures, while ovaries containing single retention cysts, cysts of the corpus lutea, large monocular cysts, fibroids and dermoids, may be resected with considerable hope for the patient's continued well-being, provided care is taken to so place the ovarian suture as not to constrict the efferent circulation. The conserved portion of the ovary must be placed in such a position in the pelvis that its circulatory equilibrium is maintained. Unless these two details are observed, resection will result in further cystic degeneration.

The fifth class includes four women applying for re-operation, because of large ventral hernia, who had had abdominal drainage at the primary operation, and presented the following intra-abdominal conditions: The omentum was firmly adherent to the abdominal scar, the sigmoid was displaced downward and attached to the pelvic peritoneum and the back of the uterus, while cecal adhesions closed the pelvis on the right side. Thus the entire pelvic cavity and its contents were walled off by the results of adhesive inflammation. The fascial opening varied in size and shape from a small circular collar 1 or 2 cm. in diameter to

a large ventral hernia 7 or 10 cm. in diameter, limited above by the umbilicus.

It is interesting to note that the greatest number of adhesions had occurred in those cases where hemostasis had been defective and where the oozing had to be controlled by pack and drain, while in those cases where infection and the liberation of pus had necessitated the isolation of the pelvis, with gauze for drainage, the results of the adhesive peritonitis which had protected the patient, had been largely absorbed.

We are combating the occurrence of both adhesions and hernia in the cases which require drainage, by two simple adaptations: First, where drainage is necessary because of the extent of the adhesive surface, the exposure of raw surfaces or uncontrollable oozing, it is our habit to fill the retropelvic cavity with zinc oxide packing or washed iodoform gauze, bringing the end out through a wide opening, not a stab wound in the culdesac; then lay the sigmoid over the pelvic pack and bring the omentum down, spreading it out over all of the intestines except the sigmoid, and tuck it under them at the pelvic brim, frequently retaining it in this position by several fine sutures, uniting it to the posterior lateral walls of the pelvis and outer edge of the broad ligament, near the pelvic wall. With the patient then placed in the Fowler position, and the gauze left in long enough for it to be completely isolated by exudate, we have found that no unfortunate complications follow.

Second, where it is necessary to use drainage by the abdominal route, as a tube or cigarette drain, we are careful never to carry this drain through the wound itself, but through a stab wound incision, remote from the line of abdominal suture, and we have found that by adopting such a procedure the integrity of the original wound is maintained.

One further point in regard to hernia, and that is the site of the incision and the mode of its closure. For intrapelvic work, no incision gives better access to the uterus and adnexa than the transverse suprapubic incision through the skin and fascia, the longitudinal separation of the recti and the transverse incision of the transversalis and peritoneum.

In the suture of such an incision we unite the transversalis by a continuous catgut suture, and run the recti together with plain catgut; the anterior sheath of the recti is lapped with a mattress stitch of chromic catgut which is reinforced by lapped mattress sutures of silkworm gut, which pass through the fascia, fat and

skin. These are tied over a gauze bolster. This secures for us a wound which even with moderate suppuration remains firm in its entirety.

I feel that the few extra minutes which it takes to close a wound in this way is justified by the results which we obtain. In using the transverse incision, the patient's convalescence is made vastly more comfortable. No pain in the wound is ever complained of if a pillow is placed under the knees, and there is moderate elevation of the shoulders.

The sixth class includes those cases where a poor or hasty toilet has been made, and must again include the product of the inexperienced, careless, or would-be speedy operator, who, either from a lack of knowledge of surgical principles or an inability to apply them, leaves his operative field with oozing unchecked, injuries to the bowel uncovered, rents in the peritoneum unsutured, or deforms the pelvis by not reestablishing the normal anatomical relations between the pelvic viscera.

Of the eight women coming under this class, three presented a lateroversion of the uterus, due to shortening of the broad ligament. One from a cellulitis occurring within the folds of the broad ligament, following the enucleation of an intraligamentous fibroid, in which complete hemostasis was not obtained. Two from taking off the tube and ovary in mass, with a ligature of heavy braided silk, thus bunching the broad ligament and shortening it. Four women presented abdominal fistula, three communicated with the bowel, while one was due to an unwithdrawn drainage pack.

One patient was the subject of a ureteroabdominal fistula. The fistulous tract was surrounded by an extensive exudate filling the left half of the pelvis. The left kidney was enlarged and tender from an ascending colon bacillus infection through the injured ureter. Nephrectomy has completely relieved the aforementioned conditions, and the patient is passing a comfortable existence.

There have been three women apply for relief from symptoms consequent upon troublesome visceral adhesions. One followed an interval appendix operation, while the other two resulted from the removal of thin-walled cysts of the ovary. All were perfectly clean cases. No pads were used in the abdomen. The intestines were not disturbed or handled, yet upon re-opening the abdomen, adhesions were general. In the appendix case the omentum was firmly attached to the entire length of the scar, the head of

the cecum and the right lateral pelvic wall, and coil after coil of intestine was found agglutinated.

In both of the cyst cases, the pelvic contents were literally matted together by firmly organized adhesions.

It is the practice of many surgeons to turn over the after-care of their operative cases to their assistants, who may be careless or inexperienced. Successful operative cures depend largely upon the detail of after-treatment. A uterus which has been the seat of subinvolution or metritis needs weeks of local treatment before its weight is diminished, even after curetment and the repair of puerperal injuries.

Resected ovaries frequently enlarge and become sensitive in the first weeks after operation. Rest, tampon, douches, and abstinence from coitus may be required to bring them to the normal.

The success of a retroversion operation depends largely on the after-treatment, *and gynecological patients as a class need proper hygiene, exercise and tonics.*

Pelvic exudates following operations for tubal infections need weeks of observation and treatment before the thickened ligaments can properly assume their functions, thus it will be seen that many of our failures are due to our omissions.

Twenty of the patients who form the basis of this study come under this class. Seven presented enlarged, sensitive uteri with a leukorrheal discharge which yielded to local treatment. Six showed large sensitive ovaries; five had exudates at the top of the broad ligaments. Two on whom suspension had been done, showed a tendency to sag in the pelvis.

From this study I venture to draw the following conclusions, *i. e.*, That our failures may be attributed to:

First, to imperfect or incomplete diagnosis.

Second, to incomplete operations.

Third, to badly chosen procedures.

Fourth, to hasty toilet.

Fifth, to insufficient after treatment.

NOTES ON CARCINOMA OF THE UTERUS.*

BY

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THE text-books published between the years 1860 and 1875 scarcely mention the subject of cancer. In 1858 Wagner contributed a monograph on carcinoma to the literature, and the first clinical picture of carcinoma was described in Schraeder's text-book in 1874. "Carcinoma was described early in the last century by pathologists, but it remained for Robin, in a paper published in 1855, to demonstrate that the disease had its commencement in epithelium. In 1865 Cornil also showed clearly the epithelial origin of the disease. In 1867 and again in 1872 Waldeyer showed conclusively that all carcinomata owe their development to a proliferation of epithelium" (Cullen). Since then the histology of cancer has become well established, but the etiology of the condition is the object of research in all countries at the present time.

All investigators state that cancer in general is increasing. Part of this increase is due to the more careful reporting of the cases, and to the fact that more people reach the cancer age than formerly. However, the statistics for England show that one in every eleven men and one in every eight women over thirty-five years of age die of cancer, which is a greater death rate for the same age period than occurs from tuberculosis. Reports from the Cancer Commission of the American Medical Association in 1909 give nearly one-half as many deaths from cancer as occurred from tuberculosis. In New York the mortality due to cancer increased in proportion to the population 25.4 per cent. in ten years, from 1896 to 1906, while the tuberculosis rate decreased 4.9 per cent. (Wainwright). The statistics of Minnesota show that about one in seventeen of the deaths in 1908 were due to cancer.

Three factors are responsible for this mortality: (1) Ignorance on the part of the laity as to the early symptoms, the fact that pain is a late symptom and that the general health is not impaired,

* Read before the Southern Minn. Med. Soc., Mankato, Jan. 16, 1912.

to the dread of cancer, and to the still prevalent belief that cancer cannot be cured. It is shown that from 94 to 97 per cent. of women with cancer of the cervix come to the surgeon too late to obtain a cure. (2) The failure of the physician to examine the patient, his inability to recognize the disease early, or his failure to give proper advice. (3) The cases which do not actually give rise to symptoms until too late for operation; this occasionally occurs.

The Commission on Cancer of the Medical Society of Pennsylvania during 1910 gives a very startling report made from data of 400 cases of carcinomata which had come to the surgeons for radical cure. In 3 per cent. of the patients with involvement of the breast, in 9 per cent. with involvement of the stomach, in 20 per cent. of uterine and 14 per cent. of ovarian involvement no physical examination was made by the physician who first saw the case. Patients consult a physician to obtain relief from symptoms; they very seldom make an objection to a complete examination, and any such objection is soon withdrawn if its importance is explained. The complete examination should be made at the first consultation; if not, the chance for cure may be lost.

Welch says: "If the sum total of all cases of cancer in women be taken the conclusion is that about one-fifth of all primary cancers are situated in the stomach, and somewhat less than one-third in the uterus." American statistics in general show that in 38.6 per cent. of the cases the disease is located in the stomach, while 27.68 per cent. are in the uterus, 15.78 per cent. in the breast and 12.59 per cent. in the liver.

Carcinoma of the cervix is considered by most authorities as much more frequent than of the body of the uterus. In 182 cases reported by Cullen, the disease occurred in the cervix in 81 per cent. and in the fundus in 19 per cent. In our series of 263 cases of cancer of the uterus (1900 to 1910 inclusive) the percentage of carcinomata of the body was higher than of the cervix; there were 58.18 per cent. in the body and 41.82 per cent. in the cervix.

Carcinoma of the cervix occurs more frequently in younger individuals, is more rapid in its course and spreads more quickly to the surrounding tissues than carcinoma of the body. In our series of 110 cases of carcinoma of the cervix the average age was 46.13 years. There were eight patients between twenty-five and thirty-five years of age, and six who were over sixty-

five years of age. The largest percentage (37.2) were between forty-five and fifty-five years of age. In this series, the duration of symptoms before coming to the surgeon was as follows: three months, or less than three months, 39.2 per cent.; six months, 13 per cent.; nine months, 12.9 per cent.; one year, 16.6 per cent.; two years, 8.7 per cent.; three years, 4.8 per cent.

In the report from Johns Hopkins Hospital of 412 cases of carcinoma of the cervix, in 61 per cent. the involvement was too extensive for more than palliative treatment. The cases at St. Mary's Hospital during the ten years stated ran a little higher percentage, abdominal hysterectomy being done in 29 per cent. of the cases, vaginal hysterectomy in 39.1 per cent., a curet and cautery in 29 per cent., and amputation of the cervix in 3.6 per cent.

The symptoms of carcinoma of the cervix may be outlined as follows: (1) An irregular flow upon exertion, following strain or coitus, a douche, or a slight bloody discharge between menstrual periods. (2) A profuse flow, like a menstrual flow, but between the regular periods, or an increase in the regular flow. (3) Any sort of a bloody discharge, no matter how slight, after the menopause. (4) The appearance of a leucorrhea, when there has been none previously, or the onset of a foul, clear watery or blood-stained discharge. (5) Pain is a late symptom and usually means that the cancer has ceased to be a local disease but has extended to the surrounding tissue and causes pressure on the nerves and blood-vessels. (6) Loss of weight and cachexia, which are also late symptoms.

In the series under discussion, a bloody discharge was present in 76.5 per cent. of the cases, a watery discharge in 28.1 per cent. An odor to the discharge in 27.2 per cent., hemorrhage in 31.8 per cent. Pain occurred in 54.5 per cent. and was present for less than three months in 32.7 per cent. of patients before they came for consultation. Loss of weight was noted in 31.8 per cent. of the cases, with no loss mentioned in 33.6 per cent.

The physical examination, if made early, will reveal a hard, irregular cervix or a hard gristle-like "feel" will be noted just within the cervix. Later, an ulcer with a hard base and a friable surface, bleeding upon examination, may be found. If examination be made at a still later stage, a friable cauliflower growth involving the entire cervix and probably extending onto the vaginal mucosa will be noted. Following an exami-

nation at this stage a hemorrhage may occur in addition to the constant bloody and watery discharge.

If the carcinoma be in the cervix above the os, the disease may be overlooked during the early stage. During examination the finger can usually be inserted through the os and comes in contact with the irregular and friable, bleeding mass just inside the canal. With any of these findings and a history of irregular, intermenstrual bleeding, time should not be lost in arriving at a definite diagnosis and the patient given the proper advice and made to understand the importance of immediate attention.

In the 110 cases in our series, menstruation was still regular in 30 per cent. and irregular in 35.4 per cent., and the menopause passed in 34.6 per cent. The average duration of irregularity was eleven months. Ninety-six and three-tenths per cent. of the women were married and 85.4 per cent. had been pregnant. Fibroids were present in 7.9 per cent. of the cases. There was a family history of malignancy in six cases. One patient had cancer of the breast as well as cancer of the cervix, when she came under observation. One had been operated upon for cancer of the breast two years before coming for the pelvic condition. Seven patients had had previous pelvic operations.

Carcinoma of the body of the uterus comes later in life, grows more slowly, remains a local disease for a longer period, and has a higher percentage of cures following operation. Carcinoma of the fundus produces the same symptoms as carcinoma of the cervix; the differentiation depends upon the physical examination. Given the history as stated above, if examination does not reveal any involvement of the cervix, the fundus should be carefully examined. The uterus is usually slightly enlarged and a little soft with perhaps a general hardness of the cervix. Upon such findings the uterus should be curetted and all of the scrapings examined microscopically. Even if no evidence of carcinoma be found, the diagnosis is not established because the area of carcinoma might have been missed by the curet. We had one patient who had a curetment for diagnosis and no evidence of malignancy was discovered, but a year later she returned with a continuation of the symptoms; a hysterectomy was then done and a carcinoma of the uterus found.

Occasionally a cervical polyp will cause an irregular bleeding. The polyp should be removed, the base cauterized, and a careful microscopic examination made. Following this operation the patient should be under close observation and if the

bleeding ceases one can feel assured that the polyp was the cause of the symptoms. If the bleeding does not cease, curetment for diagnosis should follow.

In our series of 153 cases of carcinoma of the fundus of the uterus, the average age was 50.8 years; the number having passed the menopause on the average nine years before coming to surgeon, 41.1 per cent.; regular menstruation, 17.1 per cent.; irregular menstruation, 20.2 per cent.; no mention of menstruation, 21.5 per cent. About 61.5 per cent. of the patients had been pregnant and 12.3 per cent. of these had six or more than six children. Six patients had not been married. The duration of symptoms in these patients before seeking relief was over a longer period than in those with carcinoma of the cervix; 20.2 per cent. of the patients had symptoms for three months, 15.1 per cent. for six months, 12.4 per cent. for one year, 9.8 per cent. for two years, 5.8 per cent. for three years, 4.5 per cent. for four years, and 2.6 per cent. for five years. One patient had an occasional irregular flow and hemorrhages for eleven years, and one for nine years.

Fibroids existed in 14.3 per cent. of the cases of carcinoma of the fundus. In one case there was present a fibroid and a myxoma of the ovary with carcinoma of the fundus. Ovarian tumors were present in two cases and a polypus occurred in two cases. In this series sixteen (10.4 per cent.) had had previous operation on pelvic organs.

Of the 153 cases of carcinoma of the fundus of the uterus, vaginal hysterectomy was performed in sixty-one, abdominal hysterectomy in eighty-one, curetment and cautery in ten, and ligation of arteries in one. Letters were sent to all of these patients and eighty-four have been heard from. Of these, fifty-two are now living and in good health:

Number alive at 1 year.....	9
Number alive at 2 years.....	5
Number alive at 3 years.....	6
Number alive at 4 years.....	1
Number alive at 5 years.....	8
Number alive at 6 years.....	5
Number alive at 7 years.....	6
Number alive at 8 years.....	3
Number alive at 9 years.....	4
Number alive at 10 years.....	5

Three of the patients died in the hospital, one in diabetic coma, one of pneumonia. One patient lived nine years and two months and died of pneumonia with no evidence of recurrence; another patient lived four years and died of pneumonia.

No. of patients who lived less than 1 year following operation.	15
No. of patients who lived 1 year following operation.	10
No. of patients who lived 3 years following operation.	1
No. of patients who lived 4 years following operation.	1
No. of patients who lived 8 years following operation.	1
No. of patients who lived 9 years following operation.	1

Replies were received from sixty-four of the 110 patients with carcinoma of the cervix. Of these:

No. alive at 1 year.	2
No. alive at 2 years.	6
No. alive at 3 years.	4
No. alive at 5 years.	2
No. alive at 6 years.	1
No. alive at 7 years.	2
No. alive at 9 years.	1
No. alive at 10 years.	1
No. alive at 12 years.	11

Two patients died in the hospital.

No. of patients who lived less than 1 year.	12
No. of patients who lived 1 year.	25
No. of patients who lived 2 years.	3
No. of patients who lived 4 years.	1
No time mentioned.	1

CONCLUSIONS.

1. Cancer in its early stage is removable and hence curable.
2. Cancer of the uterus usually gives symptoms in that early, operable stage.
3. Most of the deaths from cancer are due to delay, either on the part of the patient or of the physician first consulted, and are, therefore, unnecessary.
4. The laity should be made to realize that any irregular flow, a constant bloody discharge, or a watery discharge are not due to "change of life," but, in practically all cases, mean malignancy.
5. The laity must be taught that cancer is curable if operated early, *i.e.*, while still a local disease.

6. Physicians should make an early and careful examination and give the proper advice without delay.

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THE SURGICAL TREATMENT OF RETRODISPLACEMENT OF THE UTERUS.*

BY

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IN discussing the surgical treatment of retrodisplacements of the uterus I intend to limit myself to that phase of the subject pertaining to the holding of the uterus in its normal position. The necessity of repair of lacerations, curetment, the proper management of tuboovarian complications, etc., we are all agreed upon. In the beginning I wish to state that I have no new operation to offer. The possibilities of further twists and turns in the round ligaments are not exhausted, however, and there are still opportunities for the aspiring gynecologist to perpetuate his name by describing an entirely new operation or at least modifying some of the existing ones. I will admit of devising, in my periods of recreation, a number of new operations, but feeling that my name would be lost in the legion of explorers in this field, I have so far refrained from publishing my observations. How much suffering humanity has lost from my temerity can only be estimated by the poignant distress of a pioneer when he finds that a colleague claims for his own an operation which he had perfected and performed, at least once, one week before.

* Read before the Philadelphia Obstetrical Society, March, 1912.

An operation for retrodisplacement to be a good one should possess certain characteristics: First, it should be without risk to the patient; second, it should hold the uterus in its normal position and not interfere in any way with its functions; third, it should enable the operator to deal with adhesions, tuboovarian disease and other complications, if they exist; fourth, it should not endanger the life of the patient subsequent to operation.

The first of these hardly demands any discussion. While it may be argued that operations after the type of the Alexander, which do not open the abdomen, and operations by the vaginal route are safer than those which open the peritoneal cavity by the abdominal route, still in the hands of the experienced operator there is so little risk in an abdominal section that it can be discounted in view of the greater possibilities of correcting all the pathologic conditions. The claim that the Alexander operation should be the operation of choice because of its greater safety is not a valid one and is one that does not appeal to the average surgeon. Personally I have not had any mortality in operations for the correction of a displaced uterus and I am sure that this is the general experience of all latter day surgeons.

Practically all operations thus far devised will hold the uterus in a normal position and will effect a cure if the surgeon has a proper conception of the subject and will restore as far as possible all the supports of the uterus and not rest satisfied in simply depending on some method of holding the uterus forward. Any operation, short of a ventral fixation, will fail to permanently cure the condition if an extensive perineal tear is not repaired and no effort made to restore tonicity to a relaxed and bulging abdominal wall. At times failures will result no matter how thorough have been the efforts to cure the condition. Some operations fail more frequently than others, due to an inherent weakness in their technic, but some operators will claim that a particular operation is selected because of the entire absence of failures. Of course, I do not intend to impute dishonesty of purpose to any surgeon making this claim, they do it in ignorance of the true status of their postoperative results. In the majority of cases of failures further advice is sought at the hands of another surgeon and the original operator is not aware of the poor result. At most, if the operation has been properly performed, very few failures result no matter what method of bringing the uterus forward is used. If a round ligament operation is discussed the discussion usually waxes warm on the question of utilizing the

strongest or weakest part of the ligament. At best no part of the round ligament is strong enough to hold a large subinvolted uterus in normal position. While that part of the ligament nearest the uterus is thicker than that in the inguinal canal the difference is so slight that to my mind it makes no material difference which part is used to support the uterus. The round ligaments were never meant by nature to act as true supporting ligaments, and in the normal condition nature utilizes both the strong and weak parts to serve her purpose.

While all round ligament operations bring the uterus in an anterior position all of them do not restore the uterus to its normal position. Many of them bring the uterus well out of the pelvic cavity and make it an abdominal organ, others hold the organ in a more or less fixed position and do not allow a freedom of motion which it has naturally, while still others bring it so far forward as to make it impinge on the bladder. As a result these varied conditions produced by the operation, while the retrodisplacement is cured, leave in their wake many symptoms which are at least as annoying as those produced by the original condition.

The operation should not interfere with menstruation or with gestation. If the uterus is brought forward in an abnormal and exaggerated position congestion is likely to result and the menses will be both profuse and painful. It is very important then to select such an operation as will most nearly restore the organ to its proper position and which will allow a certain freedom of motion. Any operation which will in any way interfere with gestation and labor is to be condemned except, of course, in those rare cases where it is deemed necessary to perform a fixation and where the woman is deliberately sterilized. Vaginal and abdominal fixation in a child-bearing woman without sterilization is an unjustifiable procedure. This, I believe, we all agree on. I also think that most of us are in accord in reference to the propriety of doing a ventral suspension. A few surgeons still believe in ventral suspension as a routine operation; there are still thousands of people who do not believe in the efficacy of vaccination. Life is short! what is the use of wasting time trying to convince those who having eyes will not read of or having ears will not hear the records of many cases of dystocia following this operation. I do not mean that this operation should be relegated to the scrap heap entirely as it so happens that it is the only operation, at times, which we can use in a particular

case with any degree of promise of effecting a cure, but that it should be discarded as an operation of choice is unquestioned.

As a rule dystocia following any of the round ligament operations is a rarity, though as the result of improper technic, operations of the Gilliam or Ferguson type may result in an attachment of the uterus to the anterior abdominal wall if the fundus is lifted too high in the abdominal cavity. I have frequently seen operators using this type of operation lift the uterus up by grasping the fundus with bullet forceps, thus scarifying it, and shortening the ligaments to such an extent that the fundus was in contact with the parietal peritoneum. Of course, such an operation is likely to result in a ventral fixation. Again, if such a type of operation is used, the uterus being held firmly in one position by a double thickness of the round ligament, it cannot properly follow its normal bent if impregnation occurs shortly after operation and abortion is likely to result.

If the surgeon can be sure that no intraabdominal complications are coexistent with the retrodisplaced uterus then no better operation than an Alexander can be performed. That you can be reasonably sure that no complications exist I admit, but that one can be absolutely certain I question in the great majority of cases. Personally I have been disappointed many times in my diagnosis of a freely movable uterus free of adhesions and with no tuboovarian disease by finding, on opening the abdomen, lesions which I could not recognize by examination and which were not indicated in any way by the history. Because I cannot have the confidence in my examinations to eliminate complications I do not mean to intimate that others cannot. The large number of cures in the hands of many men extending over a long period of years with the Alexander operation proves the contrary. The more I see, however, of retrodisplacements of the uterus the more I am convinced that the true pathology, so far as the symptoms are concerned, is the pathology of the associated complications. The only way we can be sure that complications do not exist is to open the abdomen and to explore the pelvis. As abdominal surgery, in the clean case, is now practically without risk, I see no contraindication in the selected case, to this procedure and it is my practice always to perform an intraabdominal operation. The considerations which would prevent me from opening the abdomen would prevent me from operating by any method.

The operation should not in any way endanger the life of the

patient subsequent to operation. Many cases of intestinal obstruction have been reported following ventral suspension of the uterus and all operations which leave a band or bands of peritoneum stretching between the uterus or broad ligaments and the abdominal wall are unsafe. The Gilliam operation has been condemned for the reason that it leaves two bands of peritoneum and three pockets in the peritoneal cavity and therefore, theoretically, is twice as dangerous as ventral suspension which leaves but one band. If the operation is properly performed, however, it approaches very nearly the Montgomery and Mayo operations and leaves no band of peritoneum to cause future intestinal obstruction. If the abdominal wall is pierced near the internal ring and the round ligaments are brought through these openings they will hug the anterior face of the broad ligaments and anterior abdominal wall and no spaces or bands will be in evidence. An operation done in this manner leaves the peritoneal cavity as free of bands as do the Montgomery and Mayo operations and produces less traumatism and is free of the danger of concealed bleeding between the layers of the broad ligaments.

Having been more or less of a carping critic in this discussion it may be asked what operation I advise. In approaching a case of retro uterus I always try to approach it with an open mind, with no fixed idea of the particular kind of operation to be performed before the abdomen is opened. None of the operations advised require great technical skill and I always try to fit the operation to the case and not the case to the operation. In some I find the simple Wylie-Baer operation the best, in others the Gilliam, in still others the Baldy, in still others, rarely, ventral suspension. If I have an operation which I prefer above others it is the Baldy. To my mind this operation has certain features which make it the best operation so far proposed. It is an intraabdominal one, thus allowing direct dealing with any complications which may exist; it restores the uterus absolutely to its normal position; it does not fix the uterus in its normal position but allows a normal freedom of motion; it cures that most frequent of all complications, prolapsed ovaries; it does not interfere in any way with subsequent pregnancies; it does not endanger the life of the patient either at the time of or subsequent to operation.

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DISCUSSION.

DR. E. E. MONTGOMERY.—I was in hopes we should hear from some of the younger men first. I want to know what they are

doing. I have listened with a great deal of interest to Dr. McGlinn's presentation of the subject. It is one in which I have taken interest for a good many years. I have passed through the period of the treatment of retrodisplacement from the use of the pessary which was the only known treatment when I entered the practice of medicine. I have seen the development of the Alexander operation, ventrosuspension and the various operative procedures that have been employed in later years.

Dr. McGlinn regards the Alexander operation as one which may be employed in such cases as can be determined to be without adhesions. As he says, this is often extremely difficult to determine. Even when adhesions are suspected there may be none. On the other hand, adhesions of the tubes and ovaries are frequently found where they were unsuspected. In all such cases where the Alexander operation is done the uterus is dragged between these two forces. Another objection is that not infrequently the fundus of the uterus is enlarged so that when the ligaments are shortened the latter still hangs over and drags backward upon the ligaments. A further objection is, of course, that we are unable to determine definitely the necessary amount of pulling up and traction to be made upon the ligament to maintain the proper position of the uterus.

No one operation is applicable to every case. In some, shortening of the ligaments would be unsatisfactory. Especially is this so where the uterus has undergone chronic inflammation and this inflammation extends to the parametrial tissues fixing the uterus.

The operation devised by Dr. Baldy for holding up the uterus does unquestionably in some cases afford better support than other procedures which simply depend upon bringing forward the ligaments. As to its advisability where the ovaries are prolapsed, a better method is to spread out the broad ligament, puncture with a hemostat the thin peritoneal surface which contains blood vessels and push through the opening the ovary. It thus has a distinct shelf for support and is unlikely to be disturbed.

The operation which bears my name is one which I have found in many cases to be very satisfactory. It holds the uterus forward with ligaments that have stood the test of time, and causes no bleeding in the peritoneal cavity. There is no opportunity for the formation of adhesions and it serves in a gratifying manner the purpose for which it was devised.

DR. B. C. HIRST.—My experience has been much like that of Dr. Montgomery. When Edebohls improved the Alexander operation among others I began trying it again. I do not think the good features of this operation are appreciated as they should be. There is no risk to life, operation will be permitted when an abdominal section would not, and there are no ill consequences in subsequent gestation and labor. It has had the least proportion of recurrence of any operation I have employed for the last fifteen years and gives the patient the greatest symptomatic relief. There

is no possibility of abdominal adhesions as in such an operation as Dr. Montgomery recommends. I feel, therefore, that it has many advantages. The disadvantages urged against it can be readily overcome by the technic of operation. Dr. Montgomery has said that it is not always easy to straighten the womb by pulling on the round ligaments, but if 6 inches of round ligament are pulled out from each groin the uterus is restored to a good position. Another advantage is the improbability of hernia. In fifteen or more years I have never seen hernia occur—not after the technic of Edebohls. I have been told that hernia has followed the Alexander operation, but if done properly the inguinal canal is permanently closed as in a Bassini operation. In fifteen years I have had only one recurrence of a displacement from an Alexander operation. I cannot say that for the other operations.

Moreover, I have one patient who has had five children after an Alexander operation without recurrence. I am in favor occasionally of the vaginal correction of a retrodisplacement. That is a form of operation we all seem to forget from time to time. It is especially applicable in women approaching the age when they are not likely to have any more children.

DR. S. R. TRACY.—I have done all these operations on the round ligaments for retrodisplacement of the uterus, and consider the Alexander operation the most satisfactory in cases in which it is applicable. Unfortunately it is applicable only in a small percentage of cases. I have examined a number of patients on whom the Alexander operation had been performed, and who had subsequently gone through pregnancy and childbirth without complications that could be attributed to the operation, and in every case the uterus was in the normal anterior position. I believe the percentage of recurrences after the Alexander operation is smaller than from any other operation for retrodisplacement of the uterus. Failure following the Alexander operation is due to the ligaments not being shortened sufficiently. Some years ago at the request of Dr. Noble, I investigated the results in 150 cases in which he had performed the Alexander operation, and in only one case was there an anatomical failure. The symptomatic cures were between 80 and 90 per cent. I do not know of any other operation for the correction of retrodisplacement of the uterus, which gives such excellent results. When an intraperitoneal operation is necessary and the ovaries remain prolapsed after the uterus is placed in the normal position, I do the Baldy operation, as this technic not only corrects the displacement of the uterus, but elevates the ovaries. Before I was familiar with the Baldy operation the remaining prolapse of the ovary, after the round ligaments had been shortened, was corrected by passing a suture through the round ligament, through the clear space in the broad ligament, through the uteroovarian ligament, and then back to the round ligament.

DR. CHARLES P. NOBLE.—My own experience goes back through the entire period of the development of this question and I have

tried all of the older methods. My experience with the Alexander operation is distinctly favorable in the whole series of virgins and women in whom there has been no history of infection and in whom the bimanual examination is satisfactory. In such cases I have no hesitation in doing Alexander's operation, nor have I had any reason to regret having done it. In all discussions of this subject I have noted that the objections come from those who have had little experience. Those who have had any considerable experience with the operation are unanimous in their favor of it. I have done the operation since 1892, which is now twenty years, and as Dr. Tracy said, when we looked up the cases we knew of only one anatomical failure. Of course, there might have been failures that did not come to light. It is an unusual experience to have from any operation less than 1 per cent. of known failures. This failure was among the early cases and was due to lack of acquired skill. In other words, it was the fault of the operator and not of the operation itself. I did the operation of Edebohls and practically did it after his technic with some change in the suturing. After twenty years' experience with it in virgins and in women with no history of infection and in which the bimanual examination is satisfactory, I have no hesitancy in saying that it is an eminently satisfactory operation. So far as the intraabdominal operations are concerned there is no doubt that they are applicable to a much larger percentage of the cases, because in many women there is a history of infection and in others there may be an unsatisfactory examination. In such cases any prudent man would open the abdomen.

I think that at this time we need not discuss the question of suspension as that has been passed upon by the profession and I think the consensus of opinion is wise, that while it was an operation useful in bringing about the modern methods, in itself it should be largely, if not wholly, abandoned. Almost everyone has devised some method of dealing with the round ligaments. I also use a special method which accomplishes the same results. The operation, which is true of all intraabdominal operations I think, has not had the test of subsequent pregnancy as has the Alexander operation.

The intraabdominal shortening of the round ligament is one of the best methods for retroversion that we now have. I have never done the Baldy operation. It has not impressed me favorably because it depends upon the poorer end of the round ligament for the continued function of the ligament; but every operation must stand or fall by the test of experience and those who do this operation have found it satisfactory. As Dr. Tracy has mentioned, in prolapse of the ovaries I have fastened the uteroovarian ligament to the round ligament and have never had any difficulty in that connection in dealing with these cases. I am glad to hear a word in favor of the vaginal fixation operation in older women. For years I have advocated and done this operation in women past the menopause. It is one of the most useful additions to the means we have of dealing with these cases.

A STATISTICAL STUDY OF A SERIES OF ABORTIONS OCCURRING IN THE OBSTETRICAL DEPARTMENT OF THE JOHNS HOPKINS HOSPITAL.

BY

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AN attempt has been made, at the suggestion of Dr. J. Whitridge Williams, to analyze a series of 274 abortions occurring in a total of 4750 patients entering the obstetrical ward at the Johns Hopkins Hospital up to February 1, 1911.

Many of the results obtained are at variance with the usual statements on the subject for the reason that writers commonly attempt to arrive at conclusions as to the actual incidence of abortions, or as to the prevalence of criminal abortions, using all possible data obtainable, even the statements of the patients, in compiling their series. The tables which follow represent, however, only conditions as they occur in the service of an obstetrical hospital. It has seemed that the practical importance of such figures consists in the fact that all of the patients required medical aid and a mere passing cognizance is taken of the complete abortions for instance, which often occur in the first few days or weeks of pregnancy with little or no trouble to the patient other than a "profuse loss of blood following the retardation of the menstrual period for a few weeks."⁽¹⁾ It will easily be seen, therefore, that the statement that the complete abortions in this series occurred in a ratio to all abortions of about 1 to 8, is not unusual when considered in reference to a hospital practice, at the same time remembering that comparatively few complete abortions come to a hospital, the majority ending quite spontaneously. On the other hand, the greater part of women with incomplete abortions seek relief from symptoms. Nor is it to be contended that criminal abortions make up only 15 per cent. of all abortions or that they are to be met with only once in 115.8 obstetrical cases, but rather that such will probably be the number and percentage of criminal abortions seen in an average obstetrical hospital service.

Only those pregnancies which were interrupted before or up to about the end of the fourth lunar month have been considered as abortions,⁽²⁾ and the determination of the period of

development has been made from the history of the case, the operative findings, the examination of the fetus, or a combination of these factors.

The total number of obstetrical cases from which the series of 274 abortions is taken, is 4750. Abortions were, therefore, met with once in every seventeen and one-third cases, making an incidence of 5.76 per cent.

Abortions: 274:	Incomplete,	162	{	Complete,	8
	Complete,	35			
	Criminal,	41		Incomplete,	35
	"Missed,"	5			
	Therapeutic,	20			
	"Inevitable," followed by operation,	11			

This table shows:

(a) That incomplete abortions constitute nearly two out of every three abortions studied,—a ratio of 1 to 1.69. This is 59.12 per cent. of all abortions, and 3.41 per cent. of all cases (1 in 29.3 obstetrical cases).

(b) That complete abortions occur once in every 7.8 abortions, an incidence of 12.7 per cent., or 0.7 per cent. of all cases (1 in every 135.7 obstetrical cases).

(c) That criminal abortions are met with about once in every 6.5 abortions, an incidence of about 15 per cent. or 0.8 per cent. of all cases (1 in every 115.8 obstetrical cases).

(d) That missed abortions occur once in every fifty-five abortions, an incidence of 1.8 per cent. or about 0.1 per cent. of all cases (1 in 950 obstetrical cases).

(e) That therapeutic abortions represent one in every 13.7 abortions, an incidence of 7.3 per cent. or 0.42 per cent. of all cases (1 in every 237.5 obstetrical cases).

(f) That "inevitable" abortions, resulting in an operative ending of the pregnancy, took place once in every twenty-five abortions, an incidence of 4 per cent. or 0.23 per cent. of all cases (1 in every 431.8 obstetrical cases).

Taussig(3) states that the ratio of abortions to confinements is as 1 to 2.3. This can be at best only an estimate, since he depended upon the "histories" given by the women themselves for the basis of his statement. His figures are high for the further reason that he considers those pregnancies ending at any

time up to the end of the sixth month as abortions, using the terms abortion and miscarriage synonymously. Other investigators have given figures slightly lower than those of Taussig, and the consensus of opinion seems to place the ratio at about 1 to 6, or 8. Hall(4) quotes the following figures:

Hagne.....	1	abortion to	8-10	labors.
Devilliers.....	1	abortion to	3- 4	labors.
Whitehead.....	1	abortion to	7	labors.

He considers the estimate of Whitehead as being nearest correct.

In speaking of the percentage of criminal abortions found in this series, it is interesting to compare our figures with those of Treub and van Tussenbroeck(5) in Holland. They reported that an average of 11.3 per cent. of all abortions are criminal and this average is struck from the figures of a period of several years, the yearly percentage having steadily increased since the beginning of the period. We have noted above that 15 per cent. of the abortions of our series are criminal and our figures may well be compared with those of Treub and van Tussenbroeck, since both were collected under similar circumstances, namely from hospital records.

INCOMPLETE ABORTIONS.

Total number, 162 or 59.12 per cent. of all abortions.

Ages: Youngest, fourteen and one-half years. Oldest, forty-six years. Average age, 29.08 years. Greatest number (17), at twenty-eight years of age.

Period of development of ovum. Earliest, two under one month. Greatest number at about three months.

		Of incompl. abort's.	Of all cases.
At about 1 month.....	1.23 per cent.	1 in 81	1 in 2375
At about 1½ months.....	2.46 per cent.	1 in 40.5	1 in 1187.5
At about 2 months.....	16.05 per cent.	1 in 6.23	1 in 182.6
At about 2½ months.....	14.2 per cent.	1 in 7	1 in 206.5
At about 3 months.....	31.48 per cent.	1 in 3.17	1 in 93.1
At about 3½ months.....	14.2 per cent.	1 in 7	1 in 206.5
At about 4 months.....	19.75 per cent.	1 in 5	1 in 148.43

Infections.—As seventy-three of the 162 incomplete abortions had a temperature of 101° F. or more, we may assume that 45.06 per cent. were infected (about one in every 2.2 cases). There were five deaths in this series; accordingly 6.85 per cent. of the infected cases (one in 14.6 infected cases) died. Considering

both uninfected, in which one death occurred, and infected cases together, 3.7 per cent. of all incomplete abortions proved fatal (one in twenty-seven).

Causes of infection: Cultures were taken in forty-nine of the seventy-three infected cases.

Pure streptococcus:	11 with 3 deaths; 15.07 per cent. of infections with 27.27 per cent. mortality when infected.
Mixed, streptococcus and others:	8 with 2 deaths; 10.96 per cent. of infections with 25 per cent. mortality when infected.
<i>B. coli communis</i> :	2 or 2.74 per cent. of infections. No deaths.
<i>Staphylococcus</i> :	4 or 5.48 per cent. of infections. No deaths.
<i>Gonococcus</i> :	4 or 5.48 per cent. of infections. No deaths.
<i>B. aerog. capsul</i> :	3 or 4.1 per cent. of infections. No deaths.
<i>B. typhosus</i> :	1 or 1.37 per cent. of infections. No deaths.
<i>B. pseudo-dysenter.</i> :	1 or 1.37 per cent. of infections. No deaths.
Culture negative:	15 or 20.54 per cent. of infections. No deaths.
No culture taken:	18 or 24.65 per cent. of infections. No deaths.
Phlebitis (2); abscess of right knee; abscess of broad ligament (no cultures taken):	4 or 5.48 per cent. of infections. No deaths.
Nonpuerperal causes—pneumonia; alveolar abscess (no cultures taken):	2 or 2.74 per cent. of infections. No deaths.

Condition on discharge:

	Infected cases (73).	Uninfected cases (89).
Death.....	5 or 6.85 per cent.	1 or 1.12 per cent. (This case had subnormal temperature, being near death when admitted. Undoubtedly an infected case).
Normal.....	28 or 38.35 per cent.	51 or 57.3 per cent.
Uterus subinvolved.....	5 or 6.85 per cent.	6 or 6.74 per cent.
Uterus retroflexed or retroverted....	22 or 30.13 per cent.	18 or 20.22 per cent.
Uterus in abnormal ante-position....	2 or 2.74 per cent.	5 or 5.61 per cent.
Adherent tuboovarian masses.....	6 or 8.22 per cent.	6 or 6.74 per cent.
No note as to findings.....	5 or 6.85 per cent.	2 or 2.24 per cent.

Microscopical Findings.—These are not as complete as they might be, since many of the earlier specimens were lost.

Specimens from forty-five out of a total of eighty-nine uninfected cases were examined, with the following results:

Normal early placenta.....	11 or 24.44 per cent. of specimens examined.
Decidual endometritis.....	28 or 62.22 per cent. of specimens examined.
Placentitis.....	3 or 6.66 per cent. of specimens examined.
Inflammation of amnion and chorion.....	1 or 2.22 per cent. of specimens examined.
Syphilitic ova.....	2 or 4.44 per cent. of specimens examined.

In forty-five out of a total of seventy-three cases which had a temperature of 101° F. or more, the following conditions were noted:

Normal early placenta.....	7 or 15.55 per cent. of specimens examined.
Decidual endometritis.....	24 or 53.33 per cent. of specimens examined.
Placentitis (usually with decidual endometritis).....	9 or 20.00 per cent. of specimens examined
Placental infarction.....	2 or 4.44 per cent. of specimens examined.
Inflammation of chorion and amnion.....	2 or 4.44 per cent. of specimens examined.
Malignant glandular hyperplasia....	1 or 2.22 per cent. of specimens examined.

COMPLETE ABORTIONS.

Total number, 35 or 12.7 per cent. of all abortions.

Ages: Youngest, sixteen years. Oldest, thirty-seven years.

Average age, twenty-seven years. Period of development of ovum:

Under 1 month.....	2.85 per cent.
At about 1½ months.....	5.72 per cent.
At about 2 months.....	34.3 per cent.
At about 2½ months.....	2.85 per cent.
At about 3 months.....	11.42 per cent.
At about 3½ months.....	14.28 per cent.
At about 4 months.....	28.57 per cent.

Infections.—Twelve out of thirty-five patients with complete abortions had a temperature of 101° F., or more, an incidence of 34.28 per cent. (about one in three cases). There were no deaths in this series.

In eight cases in which a uterine culture was examined bacteriologically, the following findings were noted:

B. coli communis, 1 case.

Culture negative, 7 cases.

Of these seven cases, the elevation of temperature was apparently due to typhoid fever in one case, to thrombosis in one case, to erysipelas of the face in one case, and to syphilis(?) in one case. No report of the culture findings was noted in four of the febrile cases.

Condition of patients on discharge:

	Infected cases (12).	Uninfected cases (23).
Normal genitalia.....	4 or 33.2 per cent.	15 or 65.21 per cent.
Uterus poorly involuted or subinvoluted.....	2 or 16.6 per cent.	2 or 8.7 per cent.
Uterus retroflexed or retroverted....	2 or 16.6 per cent.	5 or 21.74 per cent.
Tuboovarian masses.....	2 or 16.6 per cent.	0
No note.....	3 or 25 per cent.	1 or 4.35 per cent.

Owing to the fact that in many cases the intact ovum had been expelled before the patients entered the hospital, only comparatively few specimens were available for study. Thus, there were none in the infected and only twelve in the noninfected cases, and examination of the latter showed the following conditions:

Normal early placenta.....	6 cases.
Decidual endometritis.....	4 cases.
Placental syphilis with inflammation of chorion.....	2 cases.

INEVITABLE ABORTIONS.

In this group of cases, the clinical symptoms were such as to demand artificial emptying of the uterus.

Total number, 10 cases or 3.65 per cent. of all abortions.

Ages: Youngest, twenty years. Oldest, thirty-seven years.

Average age, thirty years.

Febrile cases, 6 or 60 per cent. Afebrile cases, 4 or 40 per cent.

No cultures reported. No deaths occurred.

Condition of patients on discharge:

Normal genitalia.....	8 cases.
Uterus retroposed.....	1 case.
Uterus subinvolved.....	1 case.

MISSED ABORTIONS.

Vermehren(6) defines a "missed abortion" as one in which the fetal remains have been retained in the uterus at least ten weeks. A shorter time than this cannot constitute a true "missed abortion" according to him and the longest period of retention in his series was thirty-one weeks.

Total number, five cases or 1.8 per cent. of all abortions.

Ages: Youngest, eighteen years. Oldest, thirty-nine years.

Average age, 28.4 years.

Period of development of ovum: about three to four months in each case (necessarily difficult to ascertain).

Infections: None.

Length of time the product of conception was retained *in utero*:

Two months, 1 case.

About 3 months, 1 case.

About 4 months, 1 case.

About 6-7 months, 1 case.

Not known, 1 case.

Condition of patient on discharge:

Normal genitalia, 2 cases.

Adherent ovary, 1 case.

Uterus retroverted, 1 case.

Uterus subinvolved, 1 case.

Microscopical findings:

Normal early placenta, 1 case.

Placental syphilis with almost total infarction, 1 case.

Inflammation of chorion, amnion, decidua and placenta, 1 case.

Placental infarction, 1 case.

No specimen, 1 case.

THERAPEUTIC ABORTIONS.

"Artificial termination of pregnancy before the fetus has attained viability—namely, prior to the twenty-eighth week," constitutes a therapeutic abortion when done in order to save the life of the mother or, "to do away with a condition which may threaten her life if gestation continues or, to avoid certain dangers which may supervene if pregnancy is allowed to progress to full-term." (7)

Total number, twenty cases or 7.3 per cent. of all abortions.

Ages: Youngest, twenty-three years. Oldest, forty-three years. Nine cases under thirty, and eleven cases at thirty years of age or over.

Period of development of ovum:

		Of therapeutic abortions.	Of all cases.
At about 1 month.....	5 per cent.	1 in 20	1 in 4750
At about 1½ months.....	10 per cent.	1 in 10	1 in 2375
At about 2 months.....	20 per cent.	1 in 5	1 in 1187.5
At about 2½ months.....	25 per cent.	1 in 4	1 in 950
At about 3 months.....	35 per cent.	1 in 3	1 in 678.57
At about 3½ months.....	5 per cent.	1 in 20	1 in 4750

Indications for induction of abortion:

Pernicious vomiting of pregnancy, 9 or 45 per cent.

Pulmonary tuberculosis, 8 or 40 per cent.

Mitral stenosis, 1 or 5 per cent.

Pyelitis, 1 or 5 per cent.

Asthma with toxemia, 1 or 5 per cent.

Infections.—Four of the twenty patients had a temperature of 101° F., or more, accordingly 20 per cent. of the therapeutic abortions were febrile. Of these, however, only one was due to infection and then the *B. coli communis* and the *proteus vulgaris* were found. In one of the other cases the temperature was due to the underlying tuberculosis, while in the other two cases the cause was unknown.

Mortality.—Three deaths out of twenty cases, or 15 per cent. mortality. Special mention must be made of these deaths, each one of which occurred in patients operated upon for relief from toxemic vomiting of pregnancy. Two died as a direct result of prolonged toxemia and inanition, the temperature of one never going above 99.6° F. The third patient was doing fairly well, with a disappearance of the nausea and a return of appetite, when she suddenly collapsed and died. As an autopsy was not permitted, the exact cause of her death could not be determined, but it was thought that it was due either to an embolus or to cardiac paralysis from some unknown cause.

In none of these cases was death due to "infection," although for the sake of statistical fairness and in the attempt to avoid "correcting" the figures, all cases having a temperature of 101° F. or more, have been rated in the general summary as "infections," and consequently these cases are included.

Condition of patient on discharge:

Dead	3 or 15 per cent.
Normal	7 or 35 per cent.
Uterus retroflexed	6 or 30 per cent.
No note concerning examination	4 or 20 per cent.

Microscopical findings:

Normal early ovum	9 or 45 per cent.
Placentitis	1 or 5 per cent.
Decidual endometritis	1 or 5 per cent.
No examination	8 or 40 per cent.

CRIMINAL ABORTIONS.

Total number, forty-one or 15 per cent. of all abortions. Of these eight were complete and thirty-three incomplete.

Ages: Youngest, seventeen years. Oldest, forty-two years. Average age, twenty-six years.

Period of development of ovum:

	Of criminal abortions.	Of obstetrical cases.
About 1 month..... 2.44 per cent.	1 in 41	1 in 4750
About 1½ months..... 24.39 per cent.	1 in 4.1	1 in 475
About 2 months..... 21.95 per cent.	1 in 4.55	1 in 527.7
About 2½ months..... 14.63 per cent.	1 in 6.83	1 in 791.6
About 3 months..... 17.07 per cent.	1 in 5.85	1 in 678.5
About 3½ months..... 7.31 per cent.	1 in 13.7	1 in 1583
About 4 months..... 12.19 per cent.	1 in 8.2	1 in 950

Infections.—Thirty-two of the forty-one criminal abortions were infected (temperature of 101° F. or more), an incidence of 78.05 per cent.

There were no deaths in the nine uninfected cases, as compared with five in the thirty-two infected cases, a mortality of 15.62 per cent. (one in 6.4 cases). Considering both infected and uninfected cases together, it may be seen that 12.19 per cent. (5 out of a total of 41 cases) of all criminal abortions died.

Causes of infection:

Streptococcus (pure).....	7 or 21.87 per cent., with two deaths.
Mixed, streptococcus with other bacteria.....	4 or 12.5 per cent., with two death.
B. coli communis.....	2 or 6.25 per cent
B. aerog. capsulatus.....	1 or 3.12 per cent.
Staphylococcus.....	2 or 6.25 per cent.
Gonococcus.....	1 or 3.12 per cent.
Culture negative.....	6 or 18.75 per cent.
No note of findings.....	9 or 28.12 per cent., with one death.

Microscopical Findings.—Only sixteen specimens were preserved and examined from among the infected and only four from the uninfected cases. It should be remembered in this connection, that the uterus in many cases was empty at the time of admission.

	Infected (16).	Uninfected (4).
Normal early placenta.....	3 or 18.75 per cent.	1 or 25 per cent.
Decidual endometritis.....	9 or 56.25 per cent.	3 or 75 per cent.
Placentitis.....	4 or 25 per cent.	0

A brief résumé of the foregoing should possibly be made in order to compare the various tables.

In the first place, it is seen that the percentage of infections is highest in criminal abortions, namely, 78.05 per cent. with 15.62 per cent. mortality in the infected cases. The explanation

for the greater proportion of infections is obvious, and the accompanying mortality is due to the fact that the streptococcus, either alone or in combination with other bacteria, was the infecting agent in 34.37 per cent. of cases. Moreover, a few cases of streptococcus infection may have been overlooked in the "no culture" series which constitutes 28.12 per cent. of the infections, but at the same time, in making comparisons, this is compensated by a similar element of error in the other tables.

Sixty per cent. of the cases of inevitable abortion presented an elevated temperature. In all probability this was chiefly due to the absorption of toxins, rather than to actual infection, although the small number of cases makes it difficult to draw accurate conclusions.

Incomplete abortions show 45.06 per cent. of infections, which is greater than in complete abortions—34 per cent. This is probably due to the fact that the condition had usually lasted for a considerable length of time before the admission of the patient to the hospital, with a consequent greater opportunity for contamination. A mortality of 6.85 per cent. is shown in the infected incomplete abortions and this should be compared with that of the infected criminal abortions which was 15.62 per cent.

The difference in the culture findings, particularly in so far as streptococci are concerned, should be brought out. 34.37 per cent. of the criminal abortions were streptococcic, as compared to 26.03 per cent. of the incomplete abortions, while of the former, 21.87 per cent. were pure streptococcus infections, and of the latter only 15.07 per cent. The average mortality as caused by the various kinds and combinations of bacteria was practically the same in all cases. For example: pure streptococcus infections had a mortality of 33.3 per cent. in criminal and 27.27 per cent. in the incomplete abortions respectively, the virulence of the mixed infections (streptococci and others) in the criminal cases seems however, to be double that in the incomplete abortions, there being eight cases of mixed infections with two deaths in the incomplete and four with two deaths in the criminal abortions, although these are too few in number to have much weight in making definite conclusions on the subject. It is perhaps significant that no deaths occurred among the 34 per cent. of infected complete abortions, and also that streptococci were not found, while in the one case of erysipelas the uterine culture was negative.

Of the therapeutic abortions 20 per cent. were febrile, and special mention has already been made of the mortality in this series.

The missed abortions were all afebrile while under observation.

So far as the end results are concerned, the figures are fairly constant. Abnormal conditions on discharge are to be expected more often in those cases which were infected, than in uninfected cases, and retropositions are the most frequent abnormalities found. Some of these may have been pre-existing but the fact that the condition is found fairly constantly in about 25 to 30 per cent. of infected cases, and in only slightly lower average percentage (about 20 to 25 per cent.) in uninfected cases, shows that there is no direct bearing of a condition of infection or non-infection on the final results, but rather that the abortion itself plays the chief part in bringing about retropositions. Adherent masses, ovaries or tubes, or pelvic inflammatory conditions are naturally more frequent after results of infected abortions than of uninfected. Subinvolution occurs in rather variable percentages, ranging between 6 and 16 per cent. of all abortions. This is only slightly greater, if at all, than the percentage of sub-involuted uteri found at the discharge of obstetrical cases which went to term, and the occurrence of subinvolution seemed to be independent of the occurrence of infection, there being proportionately as many cases in uninfected as in infected abortions.

Pool(8) calls attention to the fact that "involution after abortion is often a longer process than when following labor at term." He states that there is a greater tendency to congestion, displacement and chronic inflammatory change of the uterus and adnexa after an abortion, but goes on to say that this is probably due to the fact that patients are allowed out of bed much earlier after an abortion than after a full-term labor, since the former is generally considered as being of relatively minor importance. In this clinic, however, the uncomplicated cases are kept in bed about ten days as a routine and, according to our figures, involution goes on under such circumstances with about the same degree of certainty that it does after labor at term.

The microscopical findings are also quite constant. It will be noticed that normal early placentæ were found in about 15 to 18 per cent. of infected cases, as compared with about 25 per cent.

of uninfected cases and, placentitis is the rule in about 25 per cent. of infected cases while it is practically absent in the others. One would expect to find decidual endometritis more often in infected than in uninfected cases. Our series shows the contrary to be true, inasmuch as this condition was seen in about 52 per cent. of the specimens from infected and about 68 per cent. from uninfected abortions.

GENERAL SUMMARY.

In 274 abortions, fourteen deaths occurred,—a mortality of 5.11 per cent. and of these, two had subnormal temperatures while under observation, one of the two being undoubtedly an infected case. Doleris(9) states that at the Hospital Boucicaut, Paris, from 1898 to 1904 inclusive, there was a total of 501 abortions with eleven deaths, or 2.2 per cent. which is considerably lower than our figures. A comparison of our mortality in all abortions (5.11 per cent.) with that of labor at term is striking. Goldsborough(10) analyzed 5000 obstetrical cases delivered at term in the Johns Hopkins Hospital and found a mortality of 1.1 per cent. It is obvious that if relatively as many normal and uncomplicated abortions had been treated, as normal and uncomplicated labors, there would have been a considerably lower percentage of mortality in the former although it would not have come as low as among the latter.

So far as infections are concerned, all cases having a temperature of 101° F. or more, have been considered as having been infected.

Total number, 117.	Mortality
Streptococcic infections.....	32 with 9 deaths = 28 per cent.
Various bacteria and "no culture findings".....	85 with 3 deaths = 3.53 per cent.
	— — —
	117 with 12 deaths = 10.25 per cent.

Thus 28 per cent. (one in 3.5 abortions) of those infected with streptococci resulted fatally and 25.35 per cent. (one in 3.65 abortions) of all which were infected were streptococcic. Figuring in this manner one in every 12.77 infected cases (about one in thirteen) is fatal. This proves itself fairly accurately for a small series and it may be generally said that one in every 10.5 to thirteen infected cases is a fatal one. The infections are considered together in the table above and it will be noted that

28 per cent. of those abortions infected with streptococci proved fatal as contrasted with only 3.53 per cent. mortality in cases infected with other bacteria.

Winter (11) has called attention to the high mortality in septic abortions and although he is by no means alone in having done so, it has possibly not been fully realized. He says that the prognosis depends to an extent upon the culture findings, laying great stress upon the relative virulence of the hemolytic and anhemolytic streptococci, but that other factors play a considerable rôle. He cites two cases which had only mild general symptoms at the time of the operation, but which developed a severe sepsis or pyemia immediately upon being cleaned out. A series of cases which he then followed convinced him that considerably better results were obtained, so far as mortality and convalescence were concerned, when the cases having present the more dangerous bacteria—the hemolytic streptococci—were treated expectantly. He waited before operating upon these cases until the hemolytic streptococci had disappeared from the vaginal secretions. When an operation was made necessary because of hemorrhage, for instance, the fever reaction was invariably greater. He considers that these observations indicate that the infective process can run out its course in spite of any retained placenta and, that they contradict Schauta in his belief that streptococci flourish in the presence of placental polyps. Winter's theory of the efficacy of expectant treatment in those particular cases for which he advises it, is certainly plausible, since it goes upon the principle which teaches that an infected uterus should not be curetted. In other words, the protecting wall of leukocytes which forms should be left as undisturbed as possible. On the other hand, it must be admitted that this wall is often inefficient or rather, insufficient, and that placental polyps do indeed make a splendid culture medium. While no attempt has been made by us to confirm these statements, which are exceedingly interesting, stress is laid upon the danger of infected abortions in general. The mortality of infected abortions at the Johns Hopkins Hospital (10.25 per cent.) is lower than in Winter's klinik (13 per cent.).

Tausig(12) says that, in general, the mortality is greater after abortions or miscarriages than after full-term labors and, Schottmüller(13) speaks of a series of 100 infected abortions with a mortality of 10 per cent. He advocates cleaning out each abortion having fever as soon as possible, so that the extension of the

infective process into the tubes or veins and lymph-vessels of the parametrium shall be hindered and he does not agree with the view that hemolytic streptococci are necessarily the chief cause of infection troubles in abortion.

Occurrence of Abortions in Negro and White Races.

Negro.	White.
Total: 74 or 27.1 per cent.	198 or 72.6 per cent.
1.....to	2.67.

In this connection, it should be stated that about 59 per cent. of the patients at this clinic are white women, and about 41 per cent., black. This makes, therefore, a ratio of about two abortions in white women to one among black. This is probably due to the greater intelligence of the white women enabling them to be more conversant with and to depend to a greater extent upon the various maneuvers, other than intrauterine manipulations, which are employed to bring about abortions although the "criminal operation" must also be considered as bringing up the ratio. Of forty-one criminal abortions, thirty-six were brought on in white women whereas only five were done in black women.

Previous Obstetrical History.

Total recorded, 267.

Having had previous abortions:

Number of Abortion.	Number of Patients.
0	122 or 45.7 per cent.
1	81 or 30.33 per cent.
2	34 or 12.73 per cent.
3	19 or 7.11 per cent.
4	4 or 1.5 per cent.
5	3 or 1.12 per cent.
6	2 or 0.75 per cent.
7	0
8	1 or 0.37 per cent.

Aborting when pregnant for first time:

22 or 8.24 per cent. Not criminal.

11 or 4.12 per cent. Criminal, 27.5 per cent. of criminal abortions.

Aborting, having had children but no abortions:

77 or 21.34 per cent. Not criminal.

13 or 5 per cent. Criminal, 32.5 per cent. of criminal abortions.

Aborting, having had abortions (one or more) but no children:

18 or 6.73 per cent. . . . Not criminal.

Aborting, having had both children and abortions:

108 or 40.89 per cent. . . . Not criminal.

16 or 5.9 per cent. . . . Criminal, 40 per cent. of criminal abortions.

The tables concerning the obstetrical history of these cases would tend to show that the "habitual aborter" is not as common as is generally supposed, since it has been brought out that women who were, according to their stories, aborting for the first time are the ones who predominate in numbers. These women may be grouped into two classes; those aborting, this being their first pregnancy and, those aborting, having had children but no previous abortions. Those being in the minority are the women who admit having already had one or more abortions without having ever completed a pregnancy (having had "no children"), this class constituting only 6.73 per cent. of the total.

The class made up of those women who were aborting, having already had both children and previous abortions, contained the greatest number of cases of any of the four classes. More criminal abortions and more "spontaneous" abortions are to be found in this latter class than in any of the others, and this may be due to several factors, such as greater knowledge of obstetrical matters and abortive maneuvers, greater tendency to uterine malpositions and endometritis following previous pregnancies, etc., etc.

Studying the figures on criminal abortions in the foregoing tables, it will be seen that these were most frequent among women who had had considerable obstetrical experience (40 per cent. of criminal abortions being among women who had "had both children and abortions"), occurring in next greatest frequency (32.5 per cent.) among women already possessed of children but who had had no previous abortions, criminal or otherwise. Women aborting when pregnant for the first time, made up 27.5 per cent. of the criminal abortions, while in this particular series those women who had had a previous abortion but had never given birth to a full-term child, were not to be found in the list of criminal abortions, this fact seeming to show that previous experience had induced these women to take greater precautions against again becoming pregnant.

Relation to Marriage:

Married.....	221 (total)	26 (criminal)	or 12.21 per cent.
Unmarried.....	37 (total)	12 (criminal)	or 32.43 per cent.
State not ascertained.....	16 (total)	3 (criminal)	or 20 per cent.

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Menstrual History: Total number considered, 274.

As to dysmenorrhea;

No pain with periods.....	126 or 46	per cent.
Some pain with periods.....	83 or 30.29	per cent.
Much pain with periods.....	37 or 13.5	per cent.
No record.....	26 or 9.5	per cent.
Never menstruated.....	2 or 0.73	per cent.

"*Menstrual Waves.*"—Mention has been made, by various writers of the occurrence of so-called "menstrual waves." It is stated that after the cessation of the menses because of the commencement of a pregnancy there are periods of increased blood-pressure, headache and backache, with occasional hot flashes, etc., which come at about the usual time of the menstrual flow. This is a period of increased liability to abortion according to these writers and our tables seem to bear out this idea.

Period of development of the ova:

	Incomplete.	Complete.	Average.
At about 1 month.....	1.23 per cent.	2.85 per cent.	2.04 per cent.
At about 1½ months.....	2.46 per cent.	5.72 per cent.	4.09 per cent.
At about 2 months.....	16.05 per cent.	34.3 per cent.	25.18 per cent.
At about 2½ months.....	14.2 per cent.	2.85 per cent.	8.53 per cent.
At about 3 months.....	31.48 per cent.	11.42 per cent.	21.45 per cent.
At about 3½ months.....	14.2 per cent.	14.28 per cent.	14.24 per cent.
At about 4 months.....	19.75 per cent.	28.57 per cent.	24.16 per cent.

It will be seen in the table above, which embraces both incomplete and complete abortions, that the majority occurred at the end of one or more lunar months or, in other words, that the ova had rounded out one, two, three, or even four full lunar months of development. On the other hand, those ova were in the minority which were cast off during the month or, to express it differently, after having developed for a fraction of one or more months. Assuming then that ova become impregnated most often about the time of the menstrual period, we may deduce that the majority of these abortions occurred during one or other of the subsequent periods of "menstrual waves," since they took place, as has been said, at the end of twenty-eight days or a multiple thereof, of development.

Probable Causes of Abortions.—The following causes of the abortions in our series are necessarily inaccurate but an endeavor has been made to ascribe the most probable cause in each case.

Cause unknown	66 or 24.16 per cent.
Criminal operation	41 or 14.96 per cent.
Retroverted or retroflexed	
uterus (on admission)	34 or 12.41 per cent.
Strain, as from lifting a heavy weight	29 or 10.06 per cent.
Decidual endometritis independent of malpositions	27 or 9.86 per cent.
Therapeutic abortions	20 or 7.29 per cent.
Trauma, as a blow over abdomen	14 or 5.11 per cent.
Abnormal ante- or lateral positions of uterus	8 or 2.92 per cent.
Syphilis	8 or 2.92 per cent.
After taking an emmenagogue	6 or 2.19 per cent.
Placentalitis	4 or 1.46 per cent.
Missed abortions	4 or 1.46 per cent.
Placental infarcts	2 or 0.73 per cent.
Typhoid fever	2 or 0.73 per cent.
Monsters	2 or 0.73 per cent.
Inflammation of culdesac	2 or 0.73 per cent.
After nongenital operations	2 or 0.73 per cent.
Malignant growth of uterus	1 or 0.36 per cent.
Chronic salpingitis (?)	1 or 0.36 per cent.
After exposure to Roentgen rays	1 or 0.36 per cent.

Williams(14) says, "It is customary to distinguish between predisposing and exciting causes of abortion." He considers in detail the various factors which predispose to abortion and then, those which may actually excite the abortion. Instead of following his schema, however, the writer has at his suggestion merely arranged the various causes of these abortions in order of their frequency.

It is difficult to say that any one factor is a cause of an abortion especially since it is usually due to a combination of factors. As an example, placentalitis may be considered as a cause of abortion but it is clear that this condition is to be found more frequently than in 1.46 per cent. of abortions, although in more than that percentage in our series it was certainly not extensive

enough to warrant the assumption that it had been the cause of the abortion even though such may actually have been the case. Franqué (15) states that inflammatory changes in the placenta are most often secondary to the death of the fetus and our figures show that placentitis is present in about 25 per cent. of infected abortions, being due to the infection since the condition is practically absent in uninfected cases, so that the question is so complicated as to allow a considerable element of error to creep in.

Considering the subject of monster formation as a cause of abortion one must refer to Mall's work on "Human Monsters." (16) He differentiates between abnormal and pathological monsters, the monstrosity of the first group being germinal in origin, while that of the second is acquired, being "developed from normal ova, due to external influences." He states further that "seven pregnancies out of every 100 give pathological ova of which but one-third give well-formed embryo monsters, or 2 per cent. of all pregnancies. The number of monsters which go on to full term is about 0.6 per cent. The embryo and fetal monsters form, therefore, 2.6 per cent. of all pregnancies, or in other words, three well-formed monsters are aborted in the early months of pregnancy for every one which goes on to the end of pregnancy. In general, I think that the form of the monsters and their classification show clearly that they are practically identical with those that grow into fetuses and then to full term, differing only in the degree of their changes. These are so radical in the embryo monsters that their lives are destroyed." Acting then as a foreign body, the uterus is stimulated to contract and the embryo is expelled.

Since decidual endometritis is probably the most common "external influence" in the causation of pathological monsters, it would seem that some of the abortions in our series which are designated as being directly due to decidual endometritis would have come under the heading of "monsters," with endometritis as an indirect cause, if the true condition of affairs could have been recognized. The majority of the patients in this series had expelled the greater part or all of each ovum before being admitted to the hospital, leaving only a few fetal remains which could be examined, with perhaps here and there a comparatively complete ovum. The number of monsters reported is the number seen and without a doubt a great number were lost to examination for the reason just given.

Ahlfeld(17) states that many abortions are due to endometritis which brings about inflammatory conditions in the placenta and membranes with adhesion formation. Williams(18) says: "The most important factor in the production of abortion is afforded by diseases and abnormalities of the decidua. In hypertrophic forms of decidual endometritis—decidua polyposa—the bulk of maternal blood brought to the placental site goes to nourish the hyperplastic decidua, while in the atrophic forms the conditions are unfavorable for the normal implantation of the ovum and the development of the placenta." He considers syphilis as a more frequent cause of abortion and miscarriage late rather than early in pregnancy.

Exposure to x-rays can undoubtedly bring about an abortion, but Schmidt(19) explains that the possibility of this in human beings is not positively known and he takes the ground that the x-rays do not have this power. In our case an x-ray photograph was taken of the patient's gall-bladder about one week before hemorrhage from the uterus began and it certainly offers a most plausible reason for the onset of the abortion

CONCLUSIONS.

I. Abortions are to be met with in an average obstetrical hospital service once in every seventeen and one-third obstetrical cases, an incidence of 5.76 per cent.

II. In such a service, incomplete abortions constitute 59.12 per cent., criminal abortions 15 per cent., complete abortions 12.7 per cent., therapeutic abortions 7.3 per cent., "inevitable" abortions 4 per cent., and missed abortions 1.8 per cent. of all abortions.

III. If it is considered that all cases having a temperature of 101° F. or more, are infected, the incidence of infections in criminal abortions will be about 78 per cent., in "inevitable" abortions about 60 per cent., in incomplete abortions about 45 per cent., in complete abortions about 34 per cent.

IV. The mortality following abortions is considerably higher than that following labors at term, the higher average being almost wholly due to the frequency with which criminal procedures are employed for inducing abortion.

V. The mortality in abortions is chiefly due to infection by streptococci and averages about 10.25 per cent. of septic cases or, 5.11 per cent. of all cases both infected and uninfected.

VI. Retroposed uteri are found at the discharge examination

of 20.25 per cent. of all abortions, the occurrence being as frequent after noninfected as after infected abortions.

VII. Involution is a relatively slower process after abortions than after labors at term but takes place with about the same degree of certainty after the former as after the latter.

VIII. Placentitis is most often the result of an infection of the uterine contents, occurring in 25 per cent. of such cases while it is practically absent in uninfected cases.

IX. Decidual endometritis is seen in about 52 per cent. of infected and 68 per cent. of uninfected abortions, showing the condition to be a cause rather than a result of abortions, the occurrence of an infection being a mere incidental matter.

X. Abortions as a whole are about twice as frequent among white as among black women and criminal abortions are nearly five times as common among whites as among blacks, due undoubtedly to a lesser degree of intelligence in the latter.

XI. The "habitual aborter" is not as common as is generally supposed.

XII. More than one-third of all criminal abortions are among married women.

XIII. The more children and previous abortions a woman has had, the more liable is she to an abortive ending of a pregnancy. Likewise, the greater her obstetrical experience, the more willing is she to submit to a criminal operation to bring about an abortion.

XIV. Uterine retropositions are the most frequent cause of spontaneous abortions, resulting decidual endometritis being a secondary matter acting possibly as an exciting cause while the former predisposed.

XV. The "menstrual waves" occurring at the times of expected menstruation, which latter has been interrupted by the existing pregnancy, are the periods of greatest liability to abortion.

In concluding this paper the writer wishes to express his great appreciation to Dr. J. Whitridge Williams for the privilege of reporting these cases.

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- JOHNS HOPKINS HOSPITAL.

TOXEMIA OF PREGNANCY.*

A CONSIDERATION OF TREATMENT.

BY

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ADEQUATE consideration of the treatment of any disease involves the prophylactic as well as the curative, and the effective application of the principles of therapeutics to any condition is founded upon an accurate knowledge of its etiological and pathological elements. This is influenced in no small degree by a recognition of the fact that the course of any disease may be modified by varying conditions that obtain in the individual host, and by cultivating a readiness to meet those modified conditions in a way best adapted to their relief.

*Read before the Medical Society of the State of New York, April 17, 1912.

A careful consideration of the individual manifestations in each case and the treatment of such case on its own evidence under the general rules of type, cannot fail to increase our efficiency in the control of disease, and especially is this true of the toxemia which occurs during pregnancy.

While it is most important to give careful study to the work and investigations of others and to apply their results when indicated, the writer wishes to protest, in the best interest of the patient, against the blind application of treatment to these cases without an exhaustive investigation of the personal characteristics of the case in hand.

The general plan of treatment of the toxemia of pregnancy has varied at different times. Some have taught that the uterus should be evacuated at the first sign of impending eclampsia, while others would forget the pregnant uterus and treat merely the symptoms. At the present time the pendulum of therapeutics tends to swing toward the latter plan; at least the emphasis seems to be on medical treatment first.

Now in this condition (as in any other) it may be considered unscientific and is usually ineffectual to treat the symptoms alone without due thought of their cause, although it must be admitted that it is natural, when dealing with a disease which has some dramatic or sensational manifestation, such as eclampsia with convulsions, to have our attention centered upon that one symptom and so lose sight of other important points which should be receiving our care at the same time. In the past it was thought that the convulsion was what killed the patient and we were taught to control the seizure at all cost and many poisons such as chloroform, morphine, hyoscin, chloral, etc., were added to those already in the circulation. We now know that some of those drugs merely added to the damage to that already done.

In approaching the subject of treatment of the toxemia of pregnancy we are confronted with the fact that there is no exact or positive knowledge of the source or nature of this toxin.

In the absence of that definite knowledge and with no working basis but fanciful and often conflicting theories which range through the realm of speculation, from a specific toxin arising in the placenta to some uncertain alimentary poison; from a disturbed liver metabolism and perversion of enzymes to a renal defect; from an absence of thyroid secretion to a retention of chlorides, it is not an easy task to prescribe a scientific prophylaxis.

At best our efforts must be curative more often than preventive but a careful study of the pathology of these cases and of the experiments that are going on in laboratories all over the world takes us a long step forward both in the cure and in the prevention of this dread condition.

While we are without knowledge of the definite toxin we must be without a specific antidote. However the pathologist has shown that this poisoning results in a marked protoplasmic degeneration throughout the various body tissues and that it is this cellular lysis, taking place in the important organs of the body, such as the liver, kidney, heart, brain, etc., which accounts for the extreme gravity of this disease. This fact suggests that a well-balanced and sustained elimination is of the first importance in preventing such cell destruction, and at the same time maintaining tissue balance with the least possible expenditure of energy on the part of those organs.

It has long been known that there is a marked reduction in the urea elimination in these cases of toxemia, but Ewing, Williams and others have shown that, while the total nitrogen output may be diminished, the relative proportion of ammonia may be very large, and have suggested that a proportion of 10 per cent. of ammonia nitrogen is an indication for a termination of the pregnancy.

Those who have followed the work of Folin and other physiologists will realize that this large output of ammonia, acetone, etc., takes place in cases of severe starvation and is an evidence of great tissue waste. In eclampsia, pernicious vomiting, etc. the high ammonia coefficient is not the direct but the indirect effect of the toxin and if we can find some way to prevent further cell destruction and at the same time provide suitable food we may expect a great advance in the treatment of this trouble. The physiologists are making progress in their work and behooves us to give that work a fair test at the bedside.

Those who had the good fortune to listen to the Carpenter lecture at the New York Academy of Medicine last October, by Dr. Loeb, have doubtless thought with what force the experiments which he described, may be applied to the solving of the question of treatment of various toxemias and that they may ultimately be of great value in indicating the nature of the poison itself.

In brief his experiments seem to prove that the various tissue cells will rapidly disintegrate in the absence of the proper pro-

portion of sodium, potassium and lime salts in the circulating fluid, the normal ratio being 100 molecules of sodium, 2.2 molecules of potassium and 1.5 molecules of lime. Any marked departure from this proportion is followed by a more or less rapid degeneration of protoplasm.

The explanation of this is that, while the cell structure contains none of the salts, their presence in the proper ratio in the fluid which surrounds the cell results in a protective action on the cell membrane. This protective process he calls "tanning" and to it he ascribes the maintenance of a stable metabolism within the cell. It seems that the chief factor in maintaining this protoplasmic equilibrium is the antagonistic action between the lime salt and the sodium and potassium.

Whether, in the absence of the lime, the others act as a direct poison or the deficiency of lime weakens the protection of the cell and so allows a direct attack on the protoplasm by some other toxin, or whether the absence of this tanning process on the cell wall, permits of an unstable diffusion of fluids in the cell, has not yet been determined.

In the stress of work and lack of time, I have not been able to find the proper authority for statements that in these cases of toxemia there is an increase of sodium chloride and also that there is an absence or deficiency of calcium chloride.

Whether this increase of sodium or the decrease of lime in the blood, is apparent or real I do not know, but I have recently tested this theory in one where the result, if due to treatment, was most remarkable. Of course I am unable to say whether the very rapid cure of this case was the direct result of, or was merely coincidental with the treatment but I feel that you are entitled to have the history of it at this time and I hope to be able to work it out in a more scientific manner at some future time.

E. P., age twenty-four, married, white, American, primipara. Family history is negative. Her menstruation began in her thirteenth year with a twenty-eight day interval, was moderate in amount for six days and with slight pain. Her last menstruation began on Sept. 7, 1911, but as she was not married until Sept. 20 it is assumed that conception took place just prior to the October period. In November, while visiting in another part of the State, she had an attack of vomiting which lasted several days. She was then quite well until late in December when the vomiting recurred but with less severity than the first time.

In January, 1912, after about three weeks of comfort the vomiting began again and was very severe for about a week. Twice during this week there was a considerable amount of blood in the vomitus. In February the attack was of shorter duration but very severe. She was then better for about a week when the vomiting returned and was almost continuous until March 13 when I saw her. She was unable to retain any thing by mouth. There was a moderate amount of albumin in the urine but no casts.

On March 16 when she was removed to the hospital her temperature was 99.4, pulse 120. Mouth was parched, lips cracked and bleeding. She was restless and complained of severe pain in the epigastrium and the vomiting continued at intervals of about an hour. The vomitus usually contained about 3 ounces of dense green fluid.

For the first twenty-four hours in the hospital she was given slow proctoclysis of a normal solution of cane-sugar. This was well retained and her thirst was in a measure relieved, although the emesis continued and at times the pain in the epigastrium was severe. The 16 ounces of urine in a twenty-four-hour specimen contained a large amount of ammonia and acetone.

The rate of the pulse increased but the quality was good and the blood-pressure remained at about 135 mm. all of the time.

Nutritive enemata of peptonized milk were given at three-hour intervals and were well retained. The vomiting continued and at times contained a moderate amount of blood. On March 20, the pulse reached 160, was much weaker, and at times irregular.

On the morning of March 21 30 grains of calcium lactate were dissolved in hot water and added to nutritive enema every two hours. During that day she complained more or less of nausea but vomited only once, a small amount of mucus.

From that time her convalescence has been rapid and she is now on a more or less general diet.

Whether this disproportion of salts in the blood is due as some have claimed, to an over consumption on the part of the fetus or to a precipitation of the lime by some special toxin is uncertain. In any event the addition of lime to the treatment is a simple matter and the theory is worthy of a fair and more scientific test.

In that phase of this condition in which the predominating symptoms indicate a profound central disturbance shown by marked hypertension, convulsions, coma, etc., our treatment must be more active and have the definite aim of preventing any further cell destruction and at the same time of maintaining what tissue function has not been destroyed.

In attempting to accomplish this we must bear in mind that

our patient is already in a state of more or less shock and in a bad condition to withstand the added burden of an anesthetic or a prolonged or severe operation. That desire which we all have, to remove the basic cause of the trouble, the pregnancy, should be tempered with conservatism. Many patients have been sacrificed by injudicious haste in emptying the uterus.

A thorough washing of the circulation is, it seems to me, of primary importance in the protection of the patient and the delivery I believe should be a secondary consideration, though it ought not be delayed too long if the patient is anywhere near term.

To wash the blood stream I make use of all of the regular methods of catharsis, hot packs, or even venesection and replace the fluids so withdrawn from the circulation with a solution of sugar. I can see no reason why a right proportion calcium salt may not be added to the solution for hypodermoclysis or intravenous infusion.

It has been suggested, that the sugar solution be made with dextrose instead of cane sugar. This would save the time and labor which an already damaged liver requires to divide the cane sugar.

With your permission I will relate one case of this type which has several interesting points. You will notice, in the first place, that the patient suffered an added shock that was nearly fatal, by the addition of veratrum viride to the other poison from which she was already suffering; secondly, that while in this condition of extreme physical depression and with a blood-pressure below 90 mm. she had a profound eclamptic seizure, and also that the intravenous infusion restored her to immediate convalescence.

J. C., age twenty-three, white, married, primipara. Family history negative. Menstruation began at age of thirteen with a thirty-day interval and was of two- to four-day duration with moderate flowing and some postmenstrual pain.

Pregnancy began in July, 1910, labor being expected in the latter part of April, 1911. During gestation she was troubled with some edema of the feet but has had no headache, vomiting, or vertigo. Heart and lungs are normal. Abdomen is oval in form and muscles firm with the fundus 5 cm. below the ensiform. Fetal heart is heard at the left and below the umbilicus. Is loud and rate 170. Presentation is vertex in the L. O. A. position. The pelvis measures 22 cm. between the spines, 27 cm. at the crests, with an external conjugate of 21.5 cm.

Urine is amber in color, acid, and 1030 specific gravity. A

trace of albumin, but no sugar or indican. Sediment contains red blood, pus, epithelium and hyaline casts. Blood-pressure is 130 mm.

Labor began April 16, 1911, at 11.15 in the morning. She was admitted to the ward in the early afternoon, and an examination at 2 o'clock showed the vertex in the L. O. A. position. Contractions five to three minutes apart lasting twenty to thirty seconds. Head high. Fetal heart strong, 160 to 170.

The cervix was obliterated and the os dilated about three fingers. The membranes ruptured spontaneously at midnight and the child was born at 4.10 A. M., April 17, 1911. Placenta delivered spontaneously at 4.27. Duration of labor seventeen hours.

There was very slight postpartum bleeding, the cervix has a slight lateral tear and the vagina not injured. There was a moderate median laceration of the perineum which was immediately repaired with three silkworm sutures.

One hour postpartum the mother's condition was good, pulse 70, fundus firm.

During the forenoon the mother was somewhat restless and vomited several times, but had no headache. At noon she had a convulsion. She was placed, immediately in a hot pack, given magnesium sulphate by mouth and fifteen minims of Norwood's tincture of veratrum subcutaneously. At this time her arterial tension was 157 and the pulse rate 120. The convulsions continued at intervals of forty to fifty minutes. In one hour another 15 minims of veratrum were given. At 2.30 the blood-pressure was down to 90 and the pulse was very feeble at 58. Strychnine, grain 1/30, was given and repeated with no apparent effect. The pupils were dilated and her respirations were shallow and irregular. At three the blood pressure was between 80 and 85 and the pulse not easily felt at the wrist.

The median basilic vein was opened and about 2 ounces of blood escaped without force. While the vein was being dissected blood-pressure reading showed about 80 mm. At this time the patient had a very severe convulsive seizure which lasted several minutes and during which all pulsations of the heart seemed to stop. The canula was inserted into the vein and 30 ounces of warm saline were slowly infused into the circulation. The pulse gradually returned at the wrist and when the infusion was finished the blood-pressure was 118 mm. and the rate 70. The patient had become conscious and was talking.

There were no more convulsions and her further convalescence was uneventful, the blood-pressure remaining between 120 and 130 all the time.

The baby was breast fed after the second day and was 4 ounces over its birth weight when mother and child were discharged fourteen days after admission.

Those who are doing abdominal surgery and are familiar with the difficulty which we often meet in getting a free action

of the bowels for some time after a severe abdominal operation, will agree that abdominal delivery is not good treatment for eclampsia. Active catharsis is our most efficient means of elimination, and a Cesarean section beside subjecting the patient to great shock will usually lock up the bowels for some time thereby robbing you of this most valuable aid in your treatment.

My custom, in antepartum eclampsia, is to begin the circulatory washing by vigorous elimination and supportive treatment in the way of fluids, strychnine, etc., and at the same time induce labor if it has not already begun and hasten the delivery as rapidly as is consistent with proper protection of the patient from great shock.

666 EAST AVENUE.

A NEW METHOD FOR MEASURING THE PELVIC OUTLET.

BY

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(With Two Illustrations.)

THE pelvic outlet has been described by Rudolph Klien as consisting of two triangular planes whose bases meet on a line which connects the two ischial tuberosities. This distance, called the transverse diameter of the outlet, is normally 11 cm. in length. The apex of the anterior triangle is the symphysis, and the sides are composed of the rami of the pubis and ischium, or lines drawn from the symphysis to the tubera ischii. The apex of the posterior triangle is the sacrococcygeal articulation which is at the lowest point or end of the sacrum. The sides of this triangle are formed by lines drawn from the tip of the sacrum to the ischial tuberosities. For convenience, I have named this the ischiosacral diameter.

In the progress of normal birth the head of the child occupies the anterior triangle and also the anterior portion of the posterior one. If for any reason the area of the anterior triangle is diminished due to a closer approximation of the ischial tuberosities, the head must necessarily require more space from the posterior triangle. In extreme cases, very little or none of the anterior triangle, but the entire posterior triangle is available for the passage of the head, and labor under these circumstances will be accompanied by a deep laceration of the perineum.

Thus it is evident that successful labor depends not only on the length of the antero-posterior diameter of the outlet but also upon the length of that portion of it which lies behind the transverse diameter, or, in other words, the space available in the posterior triangle.

Rudolph Klien believed that this could be ascertained by determining the distance from the mid-point of the transverse diameter to the sacrococcygeal articulation. This he designates as the posterior sagittal diameter of the outlet and the corresponding section in front of the transverse diameter to the symphysis as the anterior sagittal diameter. These sagittal diameters are not divisions of the antero-posterior diameter owing to the fact that the anterior and posterior triangular planes in which they lie are not in the same plane, but meet at an obtuse angle. Then Klien estimated just how much the posterior sagittal diameter must be increased in length as the transverse diameter became shorter, as in funnel shaped pelves, in order that spontaneous labor might take place, stating that if the transverse diameter is 8.5 cm., the posterior sagittal diameter must be 7 cm., and with a transverse diameter of 8 cm. the posterior sagittal must be at least 9 cm. A pelvis whose measurements fall below these limits, Klien believed incapable of transmitting a full term child, although of course by the aid of forceps and perhaps severe mutilation of the infant and laceration of the perineum, birth from such a pelvis may be accomplished.

J. W. Williams of Baltimore took the matter up at this point and after examining more than one thousand cases at the Johns Hopkins Hospital constructed a table following out Klien's idea, but differing from Klien only in some of the figures, the table proposed by Dr. Williams being as follows:

Transverse diameter.

Posterior sagittal diameter.

8 cm.
7 cm.
6.5 cm.
5.5 cm.

7.5 cm.
8 cm.
8.5 cm.
10 cm.

Klien constructed an instrument to take these measurements. It consists of a transverse bar whose length may be increased or diminished, each end being provided with a flat plate which is pressed by the thumbs against the ischial tuberosities and the

transverse diameter of the outlet measured directly. From the center of this transverse bar an arm is attached by a swivel and by rotating it anteriorly or posteriorly the anterior and posterior sagittal diameters may be measured.

But both Klien and Williams have overlooked the fact that all these measurements can be obtained in a much simpler way without the aid of any special instruments.

Both gentlemen have tried to measure from a point midway between the two ischial tuberosities which is really only a point in the air, and their instruments were devised chiefly for the purpose of enabling them to locate this point with precision.

If we remember that for any right-angled triangle the square of the hypotenuse is equal to the sum of the squares of the two opposite sides, and that if we know one side and the hypotenuse, the other side may be calculated, then we have all that is necessary for determining the sagittal diameters. For one-half the transverse diameter of the outlet is the base of a right-angled triangle of which the ischiosacral diameter is the hypotenuse and the sagittal diameter the other side. By squaring the base and subtracting from the square of the hypotenuse we obtain the square of the vertical side. Abstract the square root and we have the length of the sagittal diameter. This is to be used only for the posterior triangle. By consulting figure 1 it can be seen that owing to the blunt apex of the anterior triangle the anterior sagittal line derived by calculation would be considerably longer than by actual measurement.

But all this calculation complicates the method, a thing which must be avoided, so the idea occurred to me to reconstruct Williams' table, giving both the ischiosacral diameter and the posterior sagittal diameter for each half centimeter of shortening of the transverse diameter, as follows:

	With a transverse diameter of	and an ischiosacral diameter of	the posterior sagittal diameter is
1	8 cm.	8.5 cm.	7.5 cm.
2	7 cm.	8.7 cm.	8 cm.
3	6.5 cm.	9.1 cm.	8.5 cm.
4	5.5 cm.	10.4 cm.	10 cm.

We may just as well drop the measurement of the sagittal diameter and simply in measuring the pelvic outlet compare the transverse diameter or base of the posterior triangle with the

ischiosacral diameter or side of the posterior triangle. If the side and base of this triangle are of proportionate length as per table, it is probable that labor will proceed uninterrupted so far as the pelvic outlet is concerned. We must bear in mind that the distance from the tip of the coccyx to the transverse diameter has nothing at all to do with the size of the posterior triangle. I

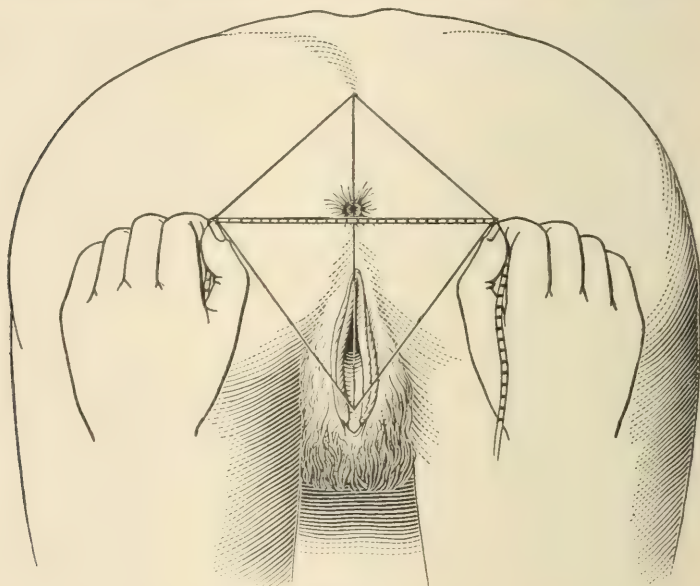


FIG. 1.

have seen cases where this distance was so short, due to an abnormally long coccyx, as to appear as if birth were impossible, but upon measuring the ischiosacral diameter and comparing with the transverse diameter it was found that the posterior triangle had room enough and to spare. In each of these cases the woman gave birth to a living child without any complications.

Another point which should be taken into consideration is the position of the woman while measurements are being taken. It is evident that if she keels on the bed with her head low and her buttocks raised as in the knee-chest position, the two ischial tuberosities are placed in the most accessible position for measurement, and the legs are out of the way just as completely as when she is flat on her back with the feet in stirrups. The exact location of the sacro-coccygeal articulation is also in this position best brought into prominence. It may be made to show clearly by inserting one finger in the vagina and moving the coccyx backwards and forwards, thus causing the skin to crease

at the joint, which may be marked by a demographic pencil. Proceed as follows :

Place the woman on the bed, face down, in the knee-chest position as described. With an ordinary tape measure marked in centimeters held between the thumbs, as illustrated, ascertain the distance between the two tuberosities. If we are careful and note at just what level the tape is, in relation to the anus, whether it crosses the upper border, middle or lower border, etc., and then

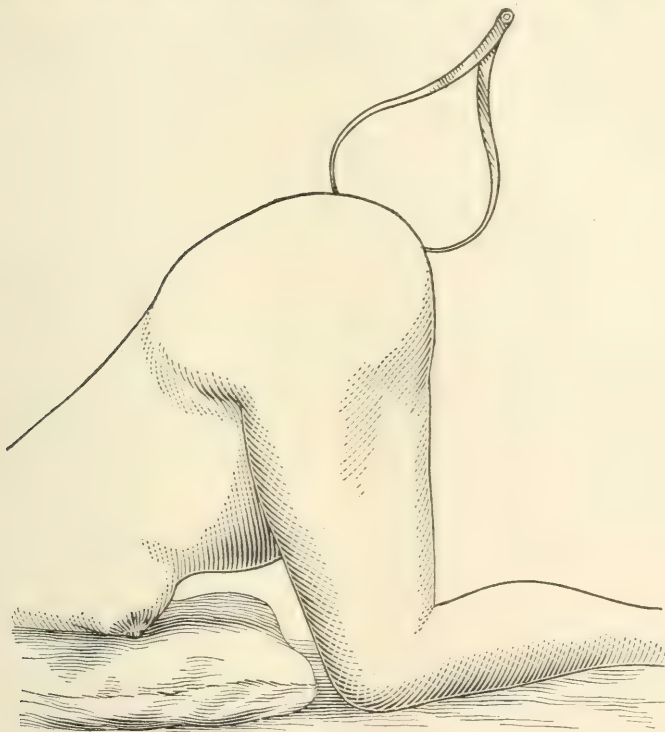


FIG. 2.

taking an ordinary pelvimeter and placing one arm against the tuberosity at exactly the same level at which the tape was held, the other arm may be made to come in contact with the sacrococcygeal articulation, and the ischiosacral diameter thus accurately measured. (Fig. 2.) This result should be checked by measuring from the tuberosity of the opposite side to the same articulation.

If the ischiosacral diameter is equal to or more than is required as per table, we may with justice to the woman and her child allow the labor to proceed. Should this diameter fall below

that required in the table it may be necessary to resort to forceps, pubiotomy or Cesarean section. Of course in deciding whether a given labor is justifiable we must also take into consideration the size of the fetal head due to lack of development, over-development, etc., extent of moulding, parity of woman, etc.

A condition of contracted pelvic outlet exists more frequently than is commonly supposed. Williams says that typical funnel pelvis constitute 55.7 per cent. of all cases of pelvic deformity in white women, and 17.8 per cent. in the colored. As each funnel pelvis means a contracted pelvic outlet we can see that the number of cases in which measurements should be taken is considerable.

The method above described has been tested in Dr. Edgar's clinics and will appear in the new 1912 edition of his text-book, "The Practice of Obstetrics," now going to press. I am indebted to Dr. H. C. Bailey for advice and for measurement of cases at Bellevue Hospital.

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COMPLETE LACERATION OF THE PELVIC FLOOR.*

BY

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I REGRET that I have not had the pleasure of seeing a complete tear operated upon at any of the clinics given for this Society at which I have had the opportunity of being present. In the consideration of the subject of complete tear, the most important point is the final result of the operation and this necessarily leads directly to the variety and technic of operation and the after-care of the patients. Owing to the limited time at my disposal, I shall not discuss the symptomatology or pathology of this condition but I shall limit my remarks to that part of the subject which deals directly with the laceration of the sphincter ani. For the purpose of this discussion, I have reviewed the histories of all the cases of complete tear which have been operated upon in the Gynecological Department of the University of Pennsylvania, during the last eleven years. I regret that I have not had sufficient time to follow the results of these cases after they have left the hospital, but it seems likely that this is comparatively unimportant. If good union and functional cure are obtained in two or three weeks, it is almost certain that these results will remain permanent unless fresh lacerations occur at subsequent labors.

During the last eleven years, there have been 121 cases of complete tear operated upon in the Gynecological Department of the University of Pennsylvania. Nineteen of these were uncomplicated, twelve were complicated by retrodisplacement of the uterus, thirty-eight were complicated by decensus or prolapsus of the uterus and fifty-two were associated with other lesions such as uterine or ovarian tumors, gastric or renal ptosis, appendicitis, etc. Fourteen of these cases had been operated upon before, in one case six previous operations had been performed, while in a number of others two or more attempts had been made to restore the parts to normal. One rather unique case was that of a young man in whom a surgeon, while relieving an imperforate anus had severed the sphincter ani. Atrophic and nondevelopmental changes might be expected in a sphincter out of commis-

* Read before the Obstetrical Society of Philadelphia, March, 1912.

sion from birth, but such was not the case and a complete functional and anatomical cure was obtained. Of these 121 cases, primary union and complete functional and anatomical cure was obtained in 119 cases. In one case, an infection in some of the stitches in the perineum occurred and an abscess which contained a dram or two of pus was evacuated. This fortunately did not interfere with the integrity of the complete tear operation and beyond the fact that the patient was detained somewhat longer in the hospital than usual made no difference in the after-result. Another case which is still in the ward has had some suppuration of a mild grade in the perineal stitches and from the present appearance of the wound it looks as if the ends of the sphincter ani had separated. This is the only failure in the series of 121 cases which, as has been before stated, comprises all the cases operated upon during the last eleven years. During this period our plan of operation has undergone a certain amount of evolution. For the first year or two the classical complete tear operation was performed with the employment of interrupted sutures of intestinal silk or Pagenstecher thread for the closure of the intestine, catgut for the sphincter and interrupted silkworm-gut for the perineum.

About six years ago Dr. B. M. Anspach suggested the use of the subcuticular suture for closure of perineal wounds and since that time this excellent method has been employed exclusively. The denudation is made in the ordinary manner, catgut is used for the crown sutures and these are introduced just within the area of denudation. After these are tied the subcuticular suture closes the skin over them. This method has been employed in all our perineorrhaphies with most satisfactory results. At first, it was the custom to introduce a few silkworm-gut stitches as tension sutures, but it was soon found that these were unnecessary and their use has been discontinued. For the last three years our method of closing the rectum has been somewhat modified. Instead of employing interrupted silk or Pagenstecher thread to close the intestine and tying these sutures within the bowel, we now utilize a submucous catgut suture in the rectovaginal septum. This closes the rectal wound accurately and completely but does not penetrate the gut and is therefore superior to our old method in that infection from the intestine is less likely to occur. It also saves time. This submucous stitch follows down the tear in the intestine, coming external to the united sphincter and is finally tied to the descending subcuticular suture of the perineorrhaphy.

It is simply a utilization of the subcuticular idea in the rectum. For purposes of convenience, it is best to bring the submucous suture down to the sphincter, unite the sphincter ends, and then continue the submucous suture down over the united sphincter ends and a little way up on the perineum where it is tied to the subcuticular suture of the perineorrhaphy. The important points in the operation are (1) careful denudation, (2) absolute identification of the sphincter ends, (3) removal of scar tissue from the sphincter ends, (4) separation of the sphincter ends from the surrounding tissue for the depth of about $1/8$ or $1/10$ inch. This is done so that accurate approximation can be obtained. (5) Accurate closure of the rectal wound and the rectovaginal septum, (6) absolute coaptation of the denuded sphincter ends, by means of buried number 1 catgut sutures, so placed that the mural circulation is not materially interfered with and that no dead space exists; these stitches embrace the sphincter fascia and a part of the muscle.

Some surgeons recommend stretching the sphincter as a preliminary step to the operation for complete tear. This procedure is unnecessary and adds somewhat to the dangers of infection. It has not been performed in any of the cases above referred to. The question of suture material is a somewhat mooted one. My own feeling is that if the surgeon can procure good catgut, this is the best material, and that many of the surgeons who object to catgut do so because they have used an inferior article. Undoubtedly, however, good results can be obtained with other suture material. Cumol-formalin catgut, prepared by the Clark-Krönig method was used in the above series of cases.

Our after-care of these cases has also undergone some modification. We have tried opening the bowels on the third day with an enema. Good results may be obtained by this routine procedure provided that the enema be carefully administered. It usually, however, causes a certain amount of pain and we now allow the patients to wait until the sixth day, when the bowels are opened by means of half an ounce of castor oil. Until the bowels open, the diet is liquid and consists chiefly of albumen water, a food which contains a large proportion of nutriment and produces comparatively little ash. The oil produces a liquid bowel movement and the patients do not suffer, nor is the wound endangered. After the bowels have been moved, the patients are allowed regular ward diet and get up on the tenth or twelfth day and can usually go home at the end of two weeks. During the second

week the bowels are regulated by cascara or licorice powder. As only catgut is employed, there are no sutures to remove. No douches are administered, but the external genitalia and perineum are irrigated with a weak boric acid solution after each urination and are then carefully dried. A sterile vulva pad is worn for the first ten days.

In concluding, I wish to say that while I believe the operation which we are now doing is the best for this type of lesion; I am sure that good results may be obtained by any one of half a dozen other plans of operation. In plastic operations in general, and in complete tear operations in particular, I think that the personal equation of the operator is of far greater importance than is the particular plan of operation selected.

The majority of operations here reported have been performed by Dr. John G. Clark in his service at the University Hospital, while the remainder have been performed by Doctors B. M. Anspach, F. Keene and the essayist.

A further and more thorough examination of the case mentioned in the text and in which it was supposed that the sphincter ends had separated, proves that this was not the case, as only a slight amount of superficial suppuration had been present in the perineal wound, which has now healed. The sphincter ends are united and an anatomical and functional cure has been obtained, so that the final results of the series of 121 cases are, 121 anatomical and functional cures and 119 cases in which primary union was obtained. No mortality and 1.55 per cent. of morbidity.

1503 LOCUST STREET.

THE ADVISABILITY OF REMOVING THE UTERUS IN CASES WHERE BOTH TUBES AND OVARIES HAVE BEEN EXCISED.*

BY
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THE subject to which I was assigned by your Program Committee is one of the deepest interest to me. The possible reasons for retaining the uterus in cases where total ablation of both tubes and ovaries has been practised, would seem limited to three: First, sentiment; second, the maintenance of the general surgical law that any unnecessary sacrifice of tissue is faulty

* Read before the Obstetrical Society of Philadelphia, March 6, 1912.

technic; and third, that the uterine body acts as a support to the pelvic floor and by its presence may prevent postoperative relaxation and vaginal prolapse.

A fourth reason which may be added is the increased gravity of the operation of hysterectomy as compared with bilateral salpingo-oophorectomy. In my opinion the first two of these reasons may well be entirely disregarded, since the first and prime object of the surgeon is the physical welfare of the patient without reference to sentiment or the dictates of surgical dogma.

As to the question of the support of the pelvic floor, it seems to me that if the cut ends of the round ligaments and the stumps of the broad ligaments be properly coaptated, the resulting support of the perineum and bladder will be far superior to that obtained by leaving *in situ* a loosely attached, heavy uterus.

Again if we consider the indications for the excision of both adnexa, we find that they are practically limited to inflammatory disease, solid neoplasms of the ovaries (usually malignant), or bilateral ovarian cysts. The condition of salpingo-oophoritis, if of severe enough type to warrant complete removal, almost presupposes a chronically infected uterus, usually enlarged, soft and the seat of a chronic passive congestion. I think there can be no adequate reason for the retention of such an organ.

In the cases of bilateral, solid tumors of the ovary, these being usually malignant, certainly carry with them some danger of metastatic inoculation of the uterus by way of the retrograde lymph channel metastasis of von Recklinghausen. Here again I consider the indication a positive one for hysterectomy.

Where large, bilateral ovarian cysts have been removed, the uterus may be perfectly normal, though usually it has suffered from pressure, alterations to the blood supply and passive congestion, and being a chronically diseased organ, should be removed.

Furthermore, in cases of marked inflammatory disease of the tubes and ovaries, characterized by dense adhesions and a total obliteration of anatomical landmarks, it is frequently impossible to be certain that all ovarian tissue has been removed. If the uterus be permitted to remain in this group of cases there will often follow a distressing continuance of irregular menstruation, associated usually with marked leukorrhea and considerable hemorrhage.

The most serious factor in this connection, however, is the increased liability to the development of malignant growths in

the uterus when blood supply, position and function have been altered by the excision of the adnexa.

This danger is a very real one, as is shown by the numerous cases recorded in medical literature, and should be emphasized as a most important reason for removal of the uterus whenever the tubes and ovaries must be sacrificed.

That hysterectomy is a more difficult and serious operation than simple salpingo-oophorectomy, goes without saying, but in the hands of the skilled surgeon the increased difficulty in technic should be more than counterbalanced by the clean-cut anatomical result.

I think the mortality of the two operations shows no appreciable difference. This applies to supravaginal hysterectomy alone and not at all to complete excision of the uterus, an operation which in my hands at least is a somewhat formidable one and not to be considered in this relation. It must be understood that it is impossible to adopt a routine method of dealing with all cases. There are many women whose physical condition is such that they could not stand the added time and shock of a hysterectomy, but could cope with the shorter operation. In other cases there are such dense adhesions of the uterus to the rectum and other portions of the large bowel that any attempt to remove the uterus would be attended with such serious damage to the intestine that it is better surgery to leave the organ in position, removing only the adnexa. With these exceptions I think the rule should be to routinely perform supravaginal hysterectomy in preference to bilateral salpingo-oophorectomy.

THE OPERATIVE TREATMENT OF PUERPERAL SEPSIS.*

BY

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BRIEFLY stated, the conclusions reached as to the treatment of puerperal sepsis by abdominal section are as follows:

1. *Indications for Operation.*—Long-continued septic symptoms, plus the development of a palpable abdominal mass. The only exception is the location of this mass in the base of the broad ligament, this type of localization almost invariably undergoing spontaneous resolution.

* Read before the Obstetrical Society of Philadelphia, March 6, 1912

2. The conditions amenable to operation are local or diffuse suppurative peritonitis; suppurative salpingitis or ovaritis; suppurative cellulitis; suppurative metritis and infected abdominal tumors.

3. An exploratory section is indicated solely to determine whether a pelvic mass, presumably containing pus, is intra- or extraperitoneal.

4. *Hysterectomy* is required in suppurative metritis, streptococcic necrosis of the uterus, ruptured uterus, and very wide spread infection of both broad ligaments. The need for hysterectomy is not apparent until the abdomen is opened.

5. *General technic* is as follows: Rapidity of operation, putting in only enough ligatures to control the bleeding; removal of only what is diseased; the leaving of the broad ligaments open, to gape, with no attempt at oversewing, and invariably drainage by means of combined glass tube and gauze, through lower end of abdominal incision, and never through the posterior vaginal vault into the vagina.

6. *Drainage* is required in these cases whenever any portion of the pelvic organs has been removed, or even extensive adhesions broken up, when the adhesions are due to an inflammation streptococcic in origin.

7. *Method of Drainage*.—A curved glass tube, about the caliber of the forefinger is placed behind the uterus in Douglas' pouch, the upper end coming out through the lower end of the abdominal incision. Around this tube, completely filling the pelvis, is packed 6-inch gauze bandage, folded in four layers so that there are no free edges to unravel, thus making a drainage strip 1 1/2 inches wide and four layers thick. The end of this strip comes out of the lower end of the abdominal incision alongside of the tube, and all the intestines are held back above the pelvic brim. This form of drainage has been arrived at by gradual elimination of other methods, and any deviation from it has proved disastrous. Drainage by gauze alone, either through the abdominal incision or through a hole in Douglas' pouch into the vagina, is useless.

8. *After-care of Drainage*.—Beginning on the day after operation, and once daily thereafter for five days, the glass tube is sucked out with a rubber catheter on the end of a piston syringe, and the wound redressed. On the sixth day the glass tube is removed. Beginning with the seventh day, the gauze packing is gradually removed, about 1/4 of the amount put in

being removed daily. On the eleventh or twelfth day the gauze is all out and a rubber tube is passed to the bottom of the sinus, and through this tube the pelvis is irrigated with sterile water once daily, the tube being gradually shortened to allow the sinus to heal from the bottom.

9. The abdominal wound is closed as carefully as if no drainage existed, is sealed above the tube with gauze and collodion, and usually remains perfectly clean, except for the drainage tract at the lower end.

10. *Stimulation*.—These patients are bad surgical subjects, and often suffer from secondary shock at any time within the first forty-eight hours. Active stimulation is thus often required.

11. Puncture of the posterior vaginal vault is required only in the rare cases when the mass is confined to the lower broad ligament, and suppurates instead of undergoing resolution, as it usually does. Resection of the ovarian and uterine veins is not reasonable, has a high mortality, and is not recommended.

Convalescence usually is complete, as far as surgical healing is concerned, in three to five weeks from the time of operation.

Results of this technic show 160 patients operated upon in the Maternity Department of the University of Pennsylvania Hospital, all desperately ill with abdominal localization of a streptococcic infection which without operation must have proved fatal, with 145 recoveries and fifteen deaths, a mortality of less than 10 per cent.

PROLAPSE OF THE UTERUS.*

BY

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PROLAPSE of the uterus is such a large subject and presents so many points of importance that it can be treated only in the most cursory manner in a discussion limited to ten minutes.

We know that prolapse of the uterus, in the vast majority of cases, is a sequel of childbirth; and we know also that the most important part in any branch of medicine is prophylaxis. Therefore it should be our aim to restore the parturient woman to as near a normal condition as possible.

* Read before the Philadelphia Obstetrical Society, March 6, 1912.

The time at which the lacerations should be repaired will depend upon the condition of the patient; the condition of the parts, the extent of the injury and somewhat upon the predilection of the operator. Each case should be decided upon its merits and no preconceived idea should be carried out in all cases. In hospital cases and in the better class of private practice, I believe, however, that a greater percentage of good results will be secured if the repair work be done from the seventh to the fourteenth day. During this period involution has progressed to a fair degree; the tissues have recovered from the trauma, have regained their vitality, and we are better enabled to determine the extent of the injury than immediately after delivery.

In cases in which there are no lacerations and in cases which have recovered from the repair work and there is a tendency to a retro-displacement of the uterus, the organ should be replaced, and the patient should be taught to assume the knee-chest position, beginning with five minutes and gradually extending the time to fifteen or twenty minutes once or twice a day. By this procedure a certain percentage of cases will be cured. The introduction of a pessary will relieve another class of cases. When these methods fail, a cure can be brought about only by a surgical operation.

Massage and exercise to tone up the muscles will be of benefit, if there be considerable relaxation of the abdominal wall. If the relaxation be marked with diastasis of the recti muscles, the condition can be cured by an appropriate operation. When all these procedures are carried out systematically and thoroughly at the proper time, prolapse of the uterus will be decidedly less frequent.

Occasionally we will see a prolapse of the uterus in the nulliparous woman. I have had two such cases. The first was a second degree prolapse in a single girl aged twenty-two years. The second was a complete prolapse in a girl aged sixteen years. Both patients were cured by operation.

Prolapse of the uterus is a surgical disease and the operation employed for its cure will depend upon the age of the patient and the conditions present. No one procedure should be applied to all cases. Each case should be decided upon its merits and the most appropriate operation executed. In dealing with prolapse of the uterus, we must bear in mind two most important facts: first, the restoration of the pelvic floor and second, the keeping of the uterus in the normal position. No matter what operation

is decided upon, thorough plastic work is most essential to obtain good results. Vaginal hysterectomy by the clamp method, hysterorrhaphy and various operations on the round and uterosacral ligaments, are practically useless unless the supporting power of the pelvic floor is restored.

The most thorough plastic work will be followed by a large percentage of failures if the uterus be not maintained in the normal anterior position. Therefore, I consider it most important in the majority of cases, to supplement the plastic work by one of the various operations on the uterine ligaments; or if the patient be past the child-bearing period, by a hysterorrhaphy.

I am well aware that some members of this Society claim, they cure all cases of prolapse of the uterus by plastic operations alone, but such statements are erroneous and not founded upon facts. No surgeon can follow every case and know the ultimate result. When there is a recurrence, the patient will frequently consult another surgeon. I have had the privilege of reoperating for some of these complete failures.

From a perusal of the more recent literature, it is evident that there is a certain percentage of failures after all operations for prolapse of the uterus. The newest fad, the interposition operation, is followed by from 2 per cent. to 32 per cent. of recurrences.

The procedure I carry out in a case of prolapse of the uterus during the child-bearing period is usually as follows: A curetment, amputation of the cervix uteri, anterior colporrhaphy, perineorrhaphy, and one of the various operations on the round ligaments. If the uterus be not enlarged and the cervix in good condition there is no occasion to amputate the cervix. If there be no bulging of the anterior wall, as in my two cases of prolapse in the nulliparous women, the tissues in this region are not disturbed.

Although there may be no laceration of the perineum, there is always considerable relaxation from the pressure of the uterus, and a perineorrhaphy should be done in all cases.

After the child-bearing period the latitude of the operative procedures is much greater. Usually the same line of procedure is followed as in the child-bearing period, but on a more extensive scale. At this age there need be no hesitation about narrowing the vagina to almost any extent, so long as the marital relations are not rendered impossible. The plastic operation is supplemented by a ventrosuspension or ventrofixation. Should a supravaginal hysterectomy be done for any reason, the cervical

stump is well suspended by suturing it to the round ligaments and the infundibulopelvic ligaments; or the cervical stump may be anchored to the abdominal wall just above the pubic bone as recommended by Baldy.

Vaginal hysterectomy with careful approximation of the broad ligaments forming a shelf on which to anchor the bladder; vaginal fixation of the uterus; the interposition operation (bringing the uterus into the vagina, in front of the bladder) and various operations which have been recommended and employed for the cure of prolapse of the uterus, are familiar to all and are merely mentioned.

When doing plastic work in the vagina, in case of prolapse or retrodisplacement of the uterus, care should be taken not to shorten the vagina. This is especially liable to be done if too much of the anterior vaginal wall is sacrificed, when the cervix is amputated, and when the crest of the rectocele is pulled down too far when the sutures are placed in the Emmett perineorrhaphy. If the vagina be shortened the cervix will be pulled nearer the vulva, the fundus of the uterus will be forced backward, and this abnormal condition will defeat the object for which the operation was undertaken.

1527 SPRUCE STREET.

TRANSFUSION IN A CASE OF TOXEMIA OF EARLY PREGNANCY WITH UNUSUAL HEMORRHAGIC MANIFESTATIONS.*

BY

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THE basis of this report is a case of pernicious vomiting of pregnancy which seemed to resist all treatment and which developed the unusual symptoms of purpura and hemophilia. It is concerning our experience in the treatment of this condition that this case is reported.

History.—Patient was twenty-seven years of age. Family history negative as to tuberculosis, cancer, hemophilia or anemic tendencies. As a child she was not very strong, poorly nourished, anemic and easily tired. At seven years of age she had what was called typhoid fever and became apparently more healthy after her convalescence. Measles and whooping cough followed with no sequelæ. Just previous to the beginning of menstruation, at thirteen, she had a few slight nose bleeds. Periods were regular, flow moderate; duration five days; very little pain. At the age

* Read before the Academy of Medicine (Section on Obstetrics and Gynecology), March 28, 1912.

of thirteen she was well and healthy. Had no illness during school life, and graduated from a nurses' training school in good health. Two months after marriage, at the age of twenty-seven, she had a somewhat prolonged period associated with dizziness and shortness of breath. The following month her period was associated with much pain, otherwise normal.

One month later she skipped period and began to have morning nausea and vomiting. She was then under the care of her physician in the country and remained under his treatment until I saw her with him, July 1, 1911, about two and one-half months after her last period.

Her vomiting had become very severe, she could keep nothing down, responded to no form of treatment or suggestion. Had lost 30 pounds. She was very anemic and sallow and her conjunctivæ and skin had a jaundiced tinge. She had had frequent nose-bleeds and occasionally blood-tinged sputum. Her tongue and lips were dry and cracked. Gums not spongy. Heart active but weak with a hemic murmur present, not transmitted. Lungs normal; liver and spleen both palpable.

By vaginal examination the cervix was found soft; uterus about size of three months' pregnancy and still in the pelvis. It seemed to be easily lifted, and patient was placed in the knee-chest position for a few minutes twice a day hoping that the change in position of uterus might influence the vomiting.

Rectal feeding was started. During the next five days she grew rapidly worse. No cessation of vomiting; nose-bleeds became more frequent and prolonged. Blood examination showed only simple anemia.

Urine examination by simple test showed only a trace of albumin, occasional hyaline casts, and red blood-cells.

She had no temperature or vaginal discharge.

Associated with her moderate jaundice, nose-bleed and blood-streaked sputum, purpuric spots began to appear on her arms and legs, dim at first and apparently well beneath the skin, although the slightest bruise would leave a black and blue mark.

She was very anxious to have a child, but as her condition was getting worse, and did not respond to treatment, under ether anesthesia, we emptied the uterus of a three months' fetus, which was apparently not viable. There was a marked tendency toward bleeding so the uterus was packed with sterile gauze.

The following day she felt better, was able to take fluids, but her nose-bleeds, blood-streaked sputum and bloody urine persisted. There was a tendency toward oozing from the packing and it was reinforced in the vagina.

On the second day an attempt to remove the packing started hemorrhage. Uterus was immediately repacked.

The petechial spots became more marked, her back being completely covered from pressure on the operating-table. She took fluids freely, was given calcium lactate in 30-grain doses. Another attempt to remove packing on the fourth day brought

on same tendency to bleed from the cervix necessitating immediate repacking. Ergot, strychnine and whiskey were tried without avail. The nose-bleed continued, and a small mole on her chin became infected. I was very anxious about the possibility of infection although the best of precautions had been taken.

Patient began to be somewhat delirious and to complain of difficulty in breathing. Also moderate cough. A rough examination of blood-clotting time revealed the fact that after ten minutes no clot had formed in a test-tube.

The patient was losing ground and medication seemed to have no effect on the hemophilic condition although she was taking fluids by mouth freely. The problem was one of getting something into her blood to induce clotting and stop this tendency toward hemophilia, and a transfusion seemed to be the best solution. Her husband, a college athlete, was taken as donor. To some of the blood-corpuscles of the patient the donor's serum was added and there was no hemolysis, the corpuscles sinking and remaining solid. Under cocaine anesthesia, about 4 inches of the radial artery of the donor was exposed and by means of the Elsberg apparatus the lumen of the artery was inserted into the slit median basilic vein of the patient, the blood allowed to flow intermittently for half an hour, the blood flowing probably twenty minutes in all.

Several physiological phenomena took place which were of special interest.

The donor's pulse was seventy-two at the start, soon went up to eighty-two, then returned and remained at seventy-two. The patient's pulse remained at 140. Her face and lips became flushed at first and pulse stronger. I was expecting a fall in rate, but none was reported. The condition of patient suggested that no blood was flowing, although I could feel it, and also proved it twice by removing the canula. The pulse was reported weaker and the patient looked badly. I stopped the transfusion after a flow of about twenty minutes and tied off the vein. Patient went into semicoma and collapse, became pulseless and blue; had a chill but was breathing fairly well. She responded to strychnine hypodermatically and whiskey per rectum. An hour later she complained of uterine pains; intestinal peristalsis became marked and she passed flatus, and the bowels moved without catharsis. Bladder resumed its tone; pulse became stronger and general condition improved.

The uterine pains continued every three-quarters of an hour for the next twelve hours. There was no more nose-bleed or bloody sputum. The uterine and vaginal packing was removed on the following day with no bleeding.

Her convalescence was gradual and she was kept under considerable tonic stimulation. Her cough which had made us anxious owing to her very low blood pressure and fear of pneumonia, cleared up. The hemorrhagic spots gradually faded. She is now, nine months after operation, perfectly well.

I have gone somewhat into detail reporting this case because I hoped to convey our process of reasoning in connection with the treatment. We tried everything I could think of except an infusion which I did not consider indicated because the patient was taking a sufficient quantity of fluids and I hesitated to increase the blood pressure without adding something to stop the hemorrhages by producing clotting. Serum might have accomplished the same result, but the transfusion seemed the wiser procedure, under the existing conditions.

The particular points of interest in this case were:

1. The failure of our treatment.
2. Our inability to prevent the vomiting without emptying the uterus.
3. The associated liver disturbance and the hemophilia.
4. The collapse after transfusion.
5. The interesting physiological phenomena following the transfusion, with the return of tone to the uterus, the bowels and bladder and the stopping of hemorrhage from all sources.

The chief point of interest to me was the appearance of the moderate jaundice and the tendency toward hemorrhage with the very long clotting time of the blood. Whether the pancreas, liver, adrenal glands, thyroid or parathyroids were at fault can only be conjectured. It was, however, true that the persistent condition had greatly reduced the clotting time of the blood and that something was lacking. With the introduction of non-hemolytic human blood by transfusion the necessary quality was regained.

107 EAST SEVENTIETH STREET.

REFLECTIONS ON THE OBSTETRICAL SCIENCE OF MAITRE FRANÇOIS RABELAIS.*

BY

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ALTHOUGH in the second chapter of *Gargantua* certain obstetrical expressions are to be found, their explanation had better not be attempted as this entire chapter is very difficult of interpretation, so that I shall begin with the third. I would also say that I have used the Bohn edition of the "*Works of Francis Rabelais*," translated from the French by Sir Thomas Urquhart and Motteux, London, 1849, in order that those who are not

* Read by invitation before the Boston Obstetrical Society, March 26, 1912.

conversant with old French may better understand the quotations.

Here, technical details abound and it is easy to find important material for this study. I will, in the first place, quote the text and then follow this with comments.

"In the vigor of his age he (Grangousier) married Gargamelle, daughter to the King of the Parpaillons, a jolly pug and well-mouthed wench. These two did oftentimes do the two-backed beast* together, joyfully rubbing and frotting their bacon against one another, in so far that at last she became great with child of a fair son, and went with him into the eleventh month . . ."

Although the first act of the mystery, whose last is labor, has a very near relationship with the art of obstetrics, since without it obstetrics would not exist, I believe it useless to refer to the particularly realistic picture painted by Rabelais to designate the fecundating act. The second portion of the paragraph just quoted will hold us longer and in the first place let us see what Maitre François says as to the possible duration of a normal pregnancy.

"For so long, yea longer, may a woman carry her great belly, especially when it is some masterpiece of nature, and a person predestinated to the performance, in his due time, of great exploits. As Homer says, that the child, which Neptune begot upon the Nymph, was born a whole year after the conception, that is the twelfth month. For, as Aulus Gellius says, lib. 3, 'This long time was suitable to the majesty of Neptune, that in it the child might receive his perfect form.' For the like reason, Jupiter made the night, wherein he lay with Alcmena last forty-eight hours, a shorter time not being sufficient for the forging of Hercules, who cleansed the world of the monsters and tyrants, wherewith it was oppressed. My masters, the ancient Pantagruelists, have confirmed that which I say, and withal declared it to be not only possible, but also maintained the lawful birth and legitimation of the infant born of a woman in the eleventh month after the decease of her husband. Hippocrates, lib. de alimento; Plinius, lib. 7, cap. 5; Plautus, in his *Cistellaria*; Marcus Varro in his satyre inscribed *The Testament*, alleging to this purpose the authority of Aristotle; Censorinus, lib. de die natali; Arist, lib. 7, cap. 3 and 4, de *Natura Animalium*; Gellius, lib. 3,

* Shakespeare later borrowed this expression from Rabelais, for in *Othello*, Act I, Scene I, we read: "Your daughter and the Moore are now making the beast with two backs."

cap. 16; Servius, in his exposition upon the verse of Virgil's *Eclogues*, *Matri longa decem*, etc., and a thousand other fools, etc."

Before quoting the texts indicated by Rabelais, it is well to remark that he only delays the pregnancy of Gargamelle in order to ridicule the absurd ideas of his time. His opinion on this subject can leave no doubt, since he does not fear, in speaking of writers quite as unquestioned as Aristotle, to refer very disrespectfully to them as "a thousand other fools." We who can judge the bad influence of the authority of Aristotle over the entire Middle Ages, a fact clearly admitted without reserve by all, must admit that it is really astonishing how Rabelais could dare to openly oppose the most respected opinions of the time. I will now transcribe a translation of the texts referred to by Rabelais.

Hippocrates says: "The fetus is formed the thirty-fifth day, it moves on seventieth and is expelled on the two hundred and tenth; there are some who believe that fifty days are necessary for its formation, 100 before movements occur, that it is expelled on the three hundredth day. This is and is not so, according to the case. Children remain in their mother's belly during all their time, or only remain a portion of this time. There are more who remain a less time than of those who remain longer."

From this it would appear that Hippocrates admits that the regular duration of normal pregnancy is 300 days and that births taking place before this time are premature. Thus he is in direct contradiction, not only with every-day facts, but seems to make light of the most elementary good sense. In point of fact, he notes that the number born before term is greater than that of births at the three hundredth day. Now, generally speaking, the commonest occurrence is usually considered as the rule, while the others form the exception, so that Hippocrates has, in this instance, set forth the rarer facts in a general law.

In his "Natural History," Plinius relates (lib. vii, cap. iv) a series of facts according to which it is quite difficult to understand his personal opinion. I here give an extract from his chapter on pregnancy.

"Man receives the light of day at all times of the year and the duration of pregnancy has no fixed term. Children are born on the seventh, eighth and up to the beginning of the tenth or eleventh month. Those who are born before the seventh do not live; it is only when they have been conceived the day before or

after the full moon or during the intermoon that children are born before the seventh month. In Egypt it is common to see children born at eight months The duration of the pregnancy varies greatly. Versilia, successively the wife of C. Heritius, Pomponius and Orsitus, very distinguished citizens, after having four times given birth at seven months, had Suillius Rufus at the eleventh, then Corbulo at the seventh, and lastly she had Cesona, wife of emperor Caligula The pretor Papirius, without heeding the entreaties of a collateral heir, gave right of possession to a child, etc."

As has been pointed out, Plinius has not any distinct opinion; he admits the possibility of living children born before the seventh month, when certain lunar influences come in play, and, on the other hand, he does not refuse to believe in the possibility of pregnancies prolonged to the eleventh month or over. Here, as in many other circumstances, Plinius has been content to collect the opinions admitted at his time, carefully collating them and using them to fill several chapters of his work on natural history. He had the merit, in the midst of the darkness of his century, to bring to light many phenomena unknown until then, so that one must overlook the fact that he admitted as true, errors which to-day appear monstrous and which, at the time he wrote, were received with that enthusiasm which all new theories obtain.

Plautus, in his comedy of *Cistellaria*, merely consecrates a few lines to the subject which interests us, only saying: "She was delivered of a child after the tenth month (of pregnancy)."

Marcus Varro assures us that the product of conception may remain *in utero* as much as eleven months. In a satire entitled *The Testament*, one can read the following lines written by Aulus Gellius: "If one or several children arrive only at the tenth month, they are dolts; I disinherit them; if it is at the eleventh, according to Aristotle's way, I make no difference between these and the former, than of Titus and Actius."

It is difficult to draw any conclusion from this sentence of Varro, for it should not be forgotten that the writer speaks in the form of satire and that the hidden sense of his allusions escapes one easily, all the more so because the fragment mentioned is quoted from Aulus Gellius and the remainder has not been handed down to us.

Censorinus, *de Die natali*, cap. vii and xi: "That a woman may be delivered at the end of seven months is not generally

admitted by the majority of writers, such as Theano, Aristotle, Diocles, Evenoxidas, Stratonicus, Empedocles, Epigeneus and many others whose compressed columns do not frighten one; excepting Euthyphron of Cnidos, who undauntedly denies this possibility. He is, in his turn, opposed by nearly all the philosophers who, following the example of Epicarnus, deny that labor can take place in the eighth month. Diocles and Carysteus, nevertheless, and Aristotle of Stagira, have thought the contrary. As to births in the ninth and tenth month, they are admitted by the majority of Chaldeans and by Aristotle of whom I have already spoken. Epigeus of Byzantium does not deny it for the ninth month, nor Hippocrates of the island of Cos for the tenth, but the eleventh month, admitted by Aristotle alone, is rejected by all the others."

It is impossible to say in what way Euthyphron of Cnidos combats the theories of his contemporaries but as to Aristotle, the following is to be found in lib. vii, cap. iv in *De Natura animalium*: "The period of gestation in animals is limited to a fixed term; the term for their delivery is not subject to variation. Man alone is born at different terms, seven, eight, nine or ten months; the latter term is the most common."

This wording is clear and there is but one way of interpreting it. Delivery at the tenth month of gestation is the general rule, verified by observation. Then, farther on, Aristotle adds: "Sometimes the duration of gestation enters the eleventh month the ignorance of the true epoch of the pregnancy is probably why women believe that they are delivered when over eleven months." He, consequently, admits as a possible exception a pregnancy of eleven months. As to pregnancies lasting longer he appears less convinced and believes that it is due to an inexact reckoning on the part of the woman.

Aulus-Gellius has no personal opinion and simply gives those of his predecessors, and it is quite astounding to notice that the ancient comic poets of Latin literature are among the writers who were authorities on obstetrical subjects. Thus, Gellusius very seriously quotes Plautus when he says in *Cistellaria*: "She with whom he had commerce was delivered of a little girl at the end of ten months." Menander and Caecilius assert similar statements in their comedies, while Servius, as is pointed out by Rabelais, merely comments on Virgil's distic: *Incipe, parve puer, risu cognoscere matrem; matri longa decem tuterint fastidia menses.*

It appears to me difficult to explain the tacit consent of these writers on points easy to verify by daily observation, and which, nevertheless, they falsified according to their pleasure. The cause of error mentioned by Aristotle certainly should receive consideration for it is evident that women do not always watch themselves, so that it is not an easy matter to formulate scientific laws and even in our day we not infrequently meet with patients who are quite unable to give the slightest idea as to the age of their pregnancy. But this fact in itself is not enough to explain why the sages of antiquity maintained their erroneous theories and, without wishing to give an unattackable explanation, I question whether it was not simply the reckoning by lunar months. Since the modern German school counts the age of gestation by weeks or lunar months, is there anything remarkable if the ancients should have followed this particular manner of calculating? At least this explanation appears to me plausible.

There now remains a few remarks relative to what physicians of the fifteenth and sixteenth centuries thought of the duration of pregnancy, as well as others who were called upon to give an opinion on this subject.

The lives of the saints, which contain fantastic legends and absurd recitals, tell us that Saint Christopher, who became gigantic in stature, was born tardily and that his mother "was eighteen months in forming him and that he produced furious pains and terrible colics in his mother while coming into the world."

Ambroise Paré, although posterior to Rabelais, sums up the theories honored in his day, in his chapter on Generation. He says: "All animals have a certain limited time for carrying their young, but man alone has no precise term nor time; thus he comes into the world at any time; thus some are born at seven months, others at eight, others at nine, which is the most common, others at ten or even the beginning of the eleventh. Massurius says that Lucius Papyrius condemned to arrest a substitute (child) made heir, on the statements of the mother of the posthumous (person) whom she said she had carried thirteen months after the death of the testator; so great is the uncertainty of any definite time for carrying children. . . . Master Nicole du Haut-pas, in his book on the *Contemplation of Human Nature*, says that the reason should not resort to astrology and holds that the eighth month is not critical like the seventh or the ninth or the eleventh,

and that the eighth is attributed to Saturn, enemy of lives and births," etc.

The judgment of Lucius Papirius was borrowed by Paré from Plinius and is unique of its kind. Emperor Adrian recognized as legal heir a child born eleven months after the death of the husband. The Jebamoth, one of the twenty-one treatises of Talmud of Babylon, declares legitimate a child born twelve months after the departure or death of the husband. The Mussulman code, Si Khelil, is still more tolerant than Roman jurisprudence, because it admits the term of five years as the extreme limit of pregnancy, but to the honor of Arabian law-makers, this duration was found exaggerated by some among them.

At the time when Gargantua was published, Niconitius had already published at Cracovia, in 1541, a thesis in which he recognized as possible a gestation of ten years' duration. Here is the suggestive title of his queer production: *Bis centum et viginti quatuor rationes dubitandi, seu argumenta unius loci, sed plurium auctoritatibus non scriptis alibi comprobata quibus videbatur filium natum ex uxore, absente marito per decennium esse legitimum*. This surpasses any comment and at the most, one may have serious doubts on the subject of this Niconitius.

The writings of Rabelais are the expression of his sentiments relative to things and men of his day and it is for this reason that we find so many different teachings in his works. He does not neglect to complete his quotations of the ancients by joyous reflections in which he clearly evinces the deepest scientific disrespect with which such aberrations inspire him: "By means whereof the honest widows may without danger play at the close-buttock game with might and main, and as hard as they can for the space of the first two months after decease of their husbands."

The chapter on the birth of Gargantua should be analyzed throughout, for from one end to the other it is filled with obstetrical terms and information.

"Gargamelle began to be a little unwell in her lower parts; whereupon Grangousier arose from off the grass, and fell to comfort her very honestly and kindly, suspecting that she was in travail, and told her that it was best for her to sit down upon the grass under the willows, because she was likely very shortly to see young feet . . ."

The first part of this paragraph shows that already, in Rabelais'

time, the analogy between labor pains and intestinal colic had been noted by the matrons of the epoch and by the public, since the good Grangousier himself knew of this.

"Saying to her withal, that although the pain was somewhat grievous to her, it would be but of short continuance, and that the succeeding joy would quickly remove that sorrow, in such sort that she should not so much as remember it. 'I will prove it,' said he, 'Our Savior says in the Gospel, Joannis xvi, "a woman, when she is in travail, hath sorrow, because her hour is come; but as soon as she is delivered of the child, she remembereth no more the anguish."' 'Ha,' said she, 'you say well, and I had much rather hear such sentences of the Gospel, and find myself the better for it, than to hear the Life of St. Margaret, or such like, canting hypocritical trumpery.' "

It is apparent that the good Grangousier is well informed on the habits of women in labor; he is aware that, during the pains and especially the period of expulsion, the majority of parturients are not content in emitting piercing cries, but frequently add the most unobliging epithets in respect to their husbands, the primary cause of their sufferings. Rabelais was not forgetful to introduce into the dialogue of the couple, some direct allusions to this particular state of mind. The continuation of Chapter VI is proof enough. As to the "trumpery," the life of St. Margaret is one of the best known specimens, but was not the exclusive appendage of the Middle Ages. The Jews caused women in the throes of labor to contemplate the "wood of life," this term being applied to two sticks of wood around which bands were rolled, bearing their Law.

If paganism was rich in superstitions, Christianity, or more exactly catholicism, simply multiplied the atrocious beliefs, and if Lilith and Hithyia disappeared, it was only to make room for numerous saints of both sexes, whose protection was no less efficacious than that of the pagan divinities. The one most in view in France in Rabelais' time, and even at the present, is without exception, St. Margaret. On July 20, the day of her fête, the churches overflow with pregnant women who go to implore the saint to favor their labors. Her relics are most numerous and are, of course, of undeniable authenticity. The Jacobins of Poitiers were the fortunate possessors of one of her ribs until it was stolen from them in the sixteenth century. Her belt was still in the Church of Saint Germain des Prés in 1789.

The queens of France believed piously in the virtue of these

relics and never failed to send for the all-powerful *débris* every time that they were about to give birth to an heir to the throne and they kept them until after their delivery. The empresses did not disdain the supernatural power of the saint, because the last French empress, Eugénie, at the birth of the imperial prince, was careful to have the celebrated relics about her. Unfortunately, time must have singularly diminished the special virtue that they formerly enjoyed, because the empress' labor was unusually difficult and the celebrated professor of obstetrics, Paul Dubois, was obliged to end it with the forceps.

The relics of this saint were not given to everybody and those who were unable to indemnify freely the holders of these precious sources of income would have been deprived of celestial aid had it not been for some compassionate souls who developed the happy thought of composing, at their intent, several orisons, the recital of which was quite enough to facilitate the labor. Occasionally, also, the relatives or charitable neighbors contented themselves by reading or relating the life of the blissful saint to the parturient. It is to this custom that the author of *Gargantua* alludes in the words of Gargamelle.

The other "trumperies" relate to secondary saints less in vogue than Margaret. *Nôtre-Dame de Montserrat*, daughter of the first count of Barcelona, enjoyed a very lively youth; possessed by the devil she was conducted to the hermit Jean Guérin in order to be exorcised. The saintly man expelled the devil and then violated the young lady, after which he cut her throat and buried her. Happily, the Virgin was watching. She commenced by restoring the victim by preserving her alive in the tomb, after which she inspired such violent repentance in the culprit that the good Jean Guérin exhumed the girl, founded an abbey on the spot, became the abbot, while the young lady became the abbess. They were, for that matter, both canonized later, to the general satisfaction of all. Happy epoch, free from both prejudice and the penal code!

Whatever may be the origin of this belief, *Nôtre-Dame de Montserrat* is supposed to facilitate labor. Her help can be manifested from a distance. It is enough to address an orison to her or to burn a *cierge* in her chapel in order to derive all possible benefit.

Many other *Nôtre-Dames* possess similar virtues and I will only mention *Nôtre-Dame de Chartres* who protected pregnancy and cured sterility. However, Henry III of France implored

her in vain. Nôtre-Dame de Lorette gave a son to one of the queens of England.

The male saints also came in for their share of the patronage of pregnant women for many centuries. St. Oyan, St. Christopher, St. Hyacinth, St. Bernard, St. André and a number of other blissful ones less known divided the honor of protecting labors.

And, lastly, there is a pilgrimage much in vogue in Aveyron, where sterile women go or if their former pregnancies ended badly. By means of a few hours of prayer and a little present of money to the abbots of the place who act the part of intermediaries between the postulants and Providence, many serious difficulties are overcome and more than one brings back from her excursion undeniable proofs of a fecundity which she had never suspected.

I trust I may be pardoned for this long digression but it is not foreign to my subject, because I simply wished to show the "trumperies" are not of the time of Rabelais alone, but exist in all centuries and all ages. Let us again take up Rabelais' text.

"A little while after she began to groan, lament, and cry. Then suddenly came the midwives from all quarters, who, groping her below, found some peloderies, which was a certain filthy stuff, and of a taste truly bad enough. This they thought had been the child, but it was her fundament that was slipt out with the mollification of her straight entrail, which you call the bum-gut, and that merely by eating of too many tripes, as we have showed you before."

The "peloderies, which was a certain filthy stuff," were very probably the membranes. These were intact as yet in Gargamelle, although labor was advanced, because the patient had begun to strain. She was, in fact, at the period of expulsion, because Rabelais is careful to say that she commenced to cry. Then, "the fundament that was slipt out" was due to the pressure of the fetal head on the perineum. The midwives who examined the august patient mistook the rectal mucosa for the bulging membranes or for a hematoma on the fetal skull, so that their error did not in any way endanger the parturient.

"Whereupon an old ugly trot in the company, who had the repute of an expert she-physician, and was come from Brisepaille, near to Saint Genou, three score years before, made her so horrible a restrictive and binding medicine, and whereby all her larris, arse-pipes, and conduits were so oppilated, stopped, obstructed,

and contracted, that you could hardly have opened and enlarged them with your teeth, which is a terrible thing to think upon."

This "old ugly trot," whose intempestive medication caused Gargantua to be born by an extraphysiological route, recalls to mind the days not so far off when ergot was administered during labor and I do not think it at all impossible that this drug may have entered into the composition of the "restrictive and binding medicine" given Gargamelle.

It is not by any means odd that a physician was not summoned to the bedside of a queen, as was the heroin of Rabelais, because accoucheurs were not introduced to court until a long time after his death. The first obstetrician who was called to give his care to a queen was Julien Clement, toward the middle of the seventeenth century. If Astruc is to be relied on, Clement attended the celebrated Mlle. de la Vallière, the famous mistress of Louis XIV, but Chérean points out that at this time Clement could not have been more than fifteen years of age, a fact which would seem to exclude the possibility of his rendering any obstetrical assistance to this famous beauty. Bussy-Rabutin relates in his "*Histoire amoureuse des Gaules*," that it was also Clement who assisted at the four labors of Mme. de Montespan and he even gives details which are so precise that they cannot be true. However this may be, there is one certainty, and that is that before the advent of Clement no obstetrician had ever penetrated the court of France. Now, as Rabelais has only produced in his work those things which passed before his eyes, there is nothing astonishing in the fact that he represented the midwives coming "from all quarters" to aid Gargamelle in her labor.

A sentiment of excessive pudor was the reason why physicians were excluded from the presence of women in labor. This prejudice, quite as exaggerated as it is stupid, was sometimes forced to the extreme. Thus in Germany, in the seventeenth century, physicians were forbidden under penalty of death, to assist at labors, and in 1522, a doctor by name Wirt, having gained entrance to a parturient, dressed in the costume of a midwife, was condemned to be burned at the stake and executed at Hamburg.

From the earliest antiquity, all works which have been handed down to us make mention of midwives. The Bible (Exodus) mentions the two most celebrated matrons of the epoch, Seiphra and Puda. They were designated by the name of Mejalledeth. The Greeks called their midwives "cord-cutters"; they were

obliged to follow a rather severe course of study and could only practice at an advanced age. They were familiar with all the abortive maneuvers then in honor. Others, in smaller number, furnished choice subjects to the Porneions of old Attica. Such was the celebrated Elephantis, who left a book on abortive drugs. Among the Romans, the physician was called only in difficult cases and it is a matter of history that Antonius Musa attended the empress Livia. As to midwives, they are frequently mentioned by Plautus and Terence, among others.

Before the year 1200, at which time the Faculty of Medicine was founded, France had a most defective medical organization. The art of obstetrics, completely neglected, was in the hands of the *ventrières*, or midwives, and the *miresses* or *cirurgiennes* who gave their care to laborious confinements. The *ventrières* verified cases of doubtful virginity, an ungrateful part to play. Jeanne d'Arc was, at the time of her trial, examined by several of these individuals. The very great ignorance of these matrons as is commonly supposed, is, I think, not greatly exaggerated and many were the deaths resulting from their inexperience. However, special schools had been inaugurated in many places, but the instruction was only two months duration and could not have been particularly instructive. But then when one recalls the way in which certain studies were carried on in the fourteenth and fifteenth centuries, the worst mistakes may very fairly be excused. Unfortunately, the moral insufficiency of the midwives greatly outstripped the scientific insufficiency and the discredit cast upon the corporation by Voisin, of sombre memory, is only too well known. Another, Constantin by name, less celebrated, devoted her practice to abortions and her last crime which caused the death of Mlle. de Guerchy, lady in waiting to Marie-Thérèse of Austria and mistress of the Duke de Vitry, resulted in her execution on the Place de Grève.

The midwives were, however, watched by the religious authorities and for a long period each midwife was obliged to take oath at the time she began to practise, before the village curate. In France at the present time there are some maternities where a special course is given by a priest on the mysteries of sacred embryology.

The "old ugly trot" committed a very serious obstetrical mistake in giving her patient "so horrible a restrictive and binding medicine," and it should be remembered that the patient was a primipara so that it was most imprudent to give any kind

of astringent, consequently the results were deplorable as Rabelais points out:

"By this inconvenience the cotyledons of her matrix were presently loosened, through which the child sprung up and leaped, and so, entering into the hollow vein, did climb by the diaphragm even above her shoulders, where the vein divides itself into two, and from thence taking his way toward the left side, issued forth at her left ear."

Who could Rabelais have had in mind that he wished to ridicule by inventing the fantastic route followed by his hero for his entrance into the world? Simply all the mythological legends and others with which he was familiar, and they are numerous. Brahma, the first personage of the Hindoo trinity, was born from a golden egg; the immortal Aphrodite was born from a sea fecundated indirectly by Ouranos under circumstances well known to all. Many other instances quite as remarkable could be cited but space forbids.

Let us return to the mechanism of the birth of Gargantua. The normal route having been rigorously closed to him by the action of the astringent medicine, the uterus became relaxed at the point of the placental insertion; the fetus finding here an exit, hastened to profit by it and entered into the inferior vena cava, undoubtedly by the middle hemorrhoids or the per-uterine plexus. However this may be, he continued upward, passing the diaphragm, reached the heart, not mentioned by Rabelais, but which he was obliged to traverse in order to reach the superior vena cava. From here he became engaged in the left brachio-cephalic trunk, went up the internal jugular, passed through the petrous sinus and escaped by the ear. During such a trip one may well ask what became of the cord. At any rate, Rabelais wishes to justify his description and after having referred to a number of extraordinary births, he closes with these words: "But you would wonder more, and with far greater amazement, if I should now present you with that chapter of Plinius, wherein he treats strange births, and contrary to nature and yet am I not so impudent a liar as he was. Read the seventh book of his Natural History, chap. 3, and trouble not my head any more about this."

It is undeniable that Pliny was an erudite and a searcher far ahead of his times, but among the thirty-seven books of his works, there are several where it seems as if the author had done his utmost to collect the most foolish yarns of the day. I will here

give a translation from the fourth (not third as indicated by Rabelais) chapter from Plinius, which is entitled: "Wonderful Labors."

"It is undoubted that three children may be born at once. . . . A larger number is looked upon as prodigious, excepting in Egypt where the water of the Nile increases fecundity. . . . Trogus tells us that in Egypt the women bring forth as many as seven children at a time. Alcippa gave birth to an elephant, but this story is one of those that are looked upon as a sinister omen. It was at the beginning of the war of the Marses that a slave gave birth to a serpent. There is an example of a child who returned into his mother's belly, at Sagonte, the year when this city was destroyed by Hannibal.

To return again to Rabelais' text, "As soon as he was born, he cried not as other babes used to do, *miez, miez, miez*, but with a high, sturdy and big voice shouted about, some drink, some drink, some drink, as inviting all the world to drink with him. The noise hereof was so extremely great that it was heard in both the countries at once, of Beauce and Bibarois."

Here, as in innumerable other cases, Rabelais turns to ridicule the erroneous beliefs of his contemporaries. A particular signification has been attributed to the cries of the newly born and many cast omens from them relative to the infant's future career. Viardel,* long after Rabelais, gravely pretends that while being born, the child more frequently has its face turned toward the ground because he is guilty of Adam's fault, and that its first cry is OA which signifies "O Adam, why did you err?" This same authority says that in twin pregnancy the ovum is single when the children are of the same sex, double when the sexes are different, so as "to inspire man from the first moment of his formation, with the laws and rules for his chastity." Viardel was an eminent man in his time, probably the most famous obstetrician of the epoch.

We have now ended with Gagantua's birth, and allusions to obstetrical subjects become much less frequent in the remainder of Rabelais' works. The four books of *Pantagruel* have little reference to the subject, but the birth of the hero will give me occasion to comment on the art of obstetrics in Rabelais' time. In the chapter entitled "Of the Nativity of the Most Dread and

* For further information relative to this eminent obstetrician, see Charles G. Cumston, "Viardel's Treatise on Obstetrics," *AMER. JOUR. Obst.*, vol. lli, No. 3. 1905.

Redoubted Pantagruel" we read: "Gargantua at the age of four hundred fourscore fifty and four begat his son Pantagruel upon his wife named Badebec, daughter to the king of the Amaurots in Utopia, who died in childbirth; for he was so wonderfully great and lumpish that he could not possibly come forth into the light of the world without thus suffocating his mother."

Here the question is perfectly clear. This was not a case of dystocia or contracted pelvis for Rabelais says that the child was "wonderfully great and lumpish" and as at this time forceps and version were unknown, symphysiotomy or the Cesarean operation would have had to have been resorted to. The forceps date from the time of the researches of Chamberlan and version was first performed in the time of Guillemeau of Orleans, a disciple of Paré, who performed forced labor on the daughter of his former master and saved her life.

As to the Cesarean operation* it was hardly ever done on the living in Rabelais' time, while symphyseotomy was not even thought of. Rabelais omits to tell us how the critical situation of his hero ended, but we know that he survived his mother. This labor was just an ordinary one, for Rabelais informs us that "when his mother Badebec was in the bringing of him forth, and that the midwives did wait to receive him, there came first out of her belly three score and eight tregeneers, that is, salt-sellers, every one of them leading in a halter a mule heavy laden with salt; after whom issued forth nine dromedaries with great loads of gammons of bacon, and dried neats' tongues on their backs . . . At the sight thereof the said midwives were much amazed," etc.

The explanation of this curious description is, I think, simple. Rabelais intends to ridicule the stories current in those days of women giving birth to rabbits, cats, lizards and divers other animals.

I now come to the close of these remarks on the obstetrical art as found in the works of this great and remarkable man, and if I have been able to demonstrate his talent in showing in a popular way the errors of his time, my task is accomplished.

871 BEACON STREET.

*Charles G. Cumston, "An Historical Notice of the Operation of Cesarean Section from the First Operation to the Middle of the Eighteenth Century," *Boston Medical and Surgical Journal*, Aug. 25, 1910.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

Meeting of March 7, 1912.

The President, GEORGE M. BOYD, M. D., in the Chair.

DR. J. A. MCGLINN read the paper of the evening.

THE SURGICAL TREATMENT OF RETRODISPLACEMENTS OF THE UTERUS.*

DR. EDWARD A. SCHUMANN read a paper entitled
THE ADVISABILITY OF REMOVING THE UTERUS IN CASES WHERE
BOTH TUBES AND OVARIES HAVE BEEN EXCISED.†

DISCUSSION.

DR. J. M. BALDY.—I performed the amputation hysterectomy in inflammatory cases in all instances in which I have had to remove the appendages of both sides. I remember very distinctly—it must have been ten or twelve years ago—when Polk proposed the procedure in New York and I proposed it simultaneously in Philadelphia. A great cry of protest was aroused. But one gynecologist in New York and one in Philadelphia supported the treatment. Within a year opinion had changed and men began to do the operation. The statement made since that time that the operation can be done more satisfactorily than the double oophorectomy in the presence of adhesions is correct. There is not only less mortality but less morbidity. It is the operation of choice. When I do not remove the uterus under such circumstances I always have a reason to give myself for not doing so, and it must be a fairly good one. Many of these cases have adhesions and when these are stripped from the uterus and the serous membrane practically destroyed there is apt to be oozing and secondary adhesions. I do not think there is a single word in my original paper that I would not include to-day were I rewriting it.

DR. GEORGE ERETY SHOEMAKER.—When the uterus is diseased I think it should be removed. When preservation of function is to be considered it is another matter.

DR. CHARLES P. NOBLE.—I was a convert to Dr. Baldy's original paper. I remember very well that when the discussion came out it impressed me unfavorably. I have no hesitancy in agree-

* For original article and discussion, see page 952.

† For original article, see page 996.

ing with all that Dr. Baldy has said of the advantages of hysterectomy when both ovaries and tubes have been removed for inflammatory disease. The great advantage in hysterectomy is that one can so much better cover the denuded raw surfaces when the adhesions are separated and in that way lessen the morbidity following the operation. It also does away with the postoperative pain so common in the days drainage was used and hysterectomy not employed. My experience is that the mortality was less with hysterectomy than without. The only class of cases in which I sometimes did not do the hysterectomy was the very class in which it is questionable whether one should operate by abdominal section. In a patient weakened by sepsis I have sometimes not removed the uterus because of the difficulty where the parts have been infiltrated from lymphangitis, due to intraperitoneal collections of pus. Such cases are much more safely treated by vaginal section, and if the abdomen is opened vaginal drainage is usually necessary.

DR. COLLIN FOULKROD.—Recently in the service of Dr. Girvin at the Presbyterian Hospital when hysterectomy has been done for inflammatory disease in which the endometrium was also diseased, we go one step further removing from above as much of the cervical endometrium as is possible, so as to leave no focus of infection in the lower portion of the cervix.

Previously we have had several cases return with profuse discharge from a cervical endometritis in the remaining stump, and in one case found it necessary to remove the remains of the uterus by the vaginal route.

DR. JOHN COOKE HIRST read a paper entitled

THE OPERATIVE TREATMENT OF PUERPERAL SEPSIS.*

DR. SWITHIN CHANDLER.—I have been working along this line, not only with my own cases that have come to me, but with others due to the courtesy of other physicians showing me their cases, for the last eight years. About four years ago I wrote a paper advocating a certain U-shaped drainage.

I have found that these septic cases generally come under three different types: hemic, abdominal, and pelvic. The hemic type is that form in which there is no apparent inflammation in the uterus or tubes. In these cases it seems impossible to do any operation and the only treatment is the injection of the vaccines. This, however, in our experience has not been satisfactory.

In the abdominal type I do not believe any operation is advisable. We had a short time ago a case which when opened showed from the diaphragm to the pelvis a mass of adhesions and pus.

The third variety is the pelvic type in which the woman seemingly suffers more than in any other. Exudate and pus are present. We have found here the gonococcus and the mixed infection with the streptococci. We had such a case about three weeks

* For original article, see page 998.

ago in which there was abscess formation and in which we were not sure whether there was an abscess or inflammatory exudate. Unfortunately we left her too long and the abscess ruptured and death occurred in six hours. It is in this variety and in this type only that an operation can be considered.

DR. HIRST, closing.—I hope the result of this discussion will be to remove from the minds of the profession in Philadelphia the feeling of pessimism with regard to the operation of these gravest puerperal conditions. Wherever I have gone I have met with disbelief as to the possibility of success to the degree that we have met with it in the worst of these cases. The kind of case under description is the worst form which any operator is called upon to manage. There is not only inflammatory, but streptococcic necrosis of the uterus, which is one of the indications for hysterectomy. Whenever the uterus is diseased it is taken out. What I want to emphasize is that these cases are not as hopeless as they have been regarded here in Philadelphia. The work forced on me is unusual. Five beds are devoted to septic cases entirely. We turn away sometimes three cases a day. The work has gone on for the last twenty years. There is a large proportion that cannot be saved without the operative treatment. Only the gravest are operated on. The death rate is less than 10 per cent. It is 100 per cent. if the cases are not subjected to operation.

DR. STEPHEN E. TRACY read a paper entitled

PROLAPSE OF THE UTERUS.*

DR. JOHN M. FISHER.—In women who have passed the menopause the operation introduced by Watkins is, I think, a most valuable procedure, especially if followed by proper restoration of the pelvic floor. In a recent case of almost complete prolapse of the uterus the cervix was amputated, an oval resection of the anterior vaginal wall was done, the bladder was dissected from the cervix, and after delivering the body of the uterus through an opening in the vesicouterine fold it was sutured to the vaginal wall beneath the base of the bladder. This was followed by a triangular resection of the posterior vaginal wall exposing the rectum, and the levator muscles laterally. The edges of the latter were sutured together over the rectum with buried chromic catgut. The retracted bulbocavernosus and transversus perinei muscles were again reunited by superimposed buried sutures followed by closure of the mucous membrane and skin.

In cases of moderate prolapse after doing the necessary plastic work on cervix and vaginal walls I favor shortening of the round ligaments by the Montgomery method. Contrary to what has been said of prolapsed ovaries I have found that shortening the round ligaments in this way brings the ovaries up into a better position. The necessary traction on the round ligament drags a part of the broad ligament with it thus forming a shelf or depres-

* For original article, see page 1000.

sion on the posterior face of the latter upon which the ovary subsequently rests.

DR. McGLINN.—The question of cure of prolapse of the uterus has resulted in the proposal of almost as many operations as for retrodisplacement. As a matter of fact no one operation is applicable to all cases and many operations are capable of curing the condition. In those cases which refuse operation and which of necessity must wear some sort of a support to hold the uterus in position I have treated satisfactorily with the Menges pessary.

DR. CHARLES C. NORRIS read a paper entitled

COMPLETE LACERATION OF THE PELVIC FLOOR.*

DR. BROOKE M. ANSPACH.—I can only repeat what Dr. Norris has said; the results of our operations have been very good following out the plan he has given you. I remember that when I was a resident in the University Hospital, an operation for complete tear was looked upon as being rather uncertain in its results, but now it is almost invariably entirely successful.

The present plan of using catgut entirely for suture material, and not passing any sutures through the rectal mucous membrane, has added materially to the success of the operation. It has also been demonstrated that it is quite unnecessary to keep the bowels locked up for a long period; five or six days is quite sufficient, the patient, meanwhile, being kept on a diet of albumin water, and the bowels moved ultimately by castor oil, assisted possibly by an enema, given through a small rubber catheter. It is absolutely necessary, of course, in relying upon catgut exclusively, in these operations, to be very sure of the tensile strength and durability of the gut; but if one has reliable material which will not become absorbed under fifteen days, success will be uniform.

The opponents of catgut take the same ground that the advocates of silkworm-gut, or silver wire sutures took for such a long time in respect to the abdominal incision. It is surely the method of the future, and I believe will be universally adopted as soon as the prejudice against it has worn out.

DR. BARTON COOKE HIRST.—The stretching of the sphincter is one feature of the operation. It prevents the spasmodic contraction of the sphincter and enables the stitches to keep the ends closer together for a longer time.

In the after-treatment, I open the bowels of these patients at the very start keep them liquid for two weeks.

In regard to the sutures in my large clinical material in the University Hospital, I tried catgut for a time but had to give it up because of occasional premature absorption. I am certain that anyone using catgut entirely must have a large percentage of failures. I feel that I cannot dispense with unabsorbable suture material. I have tried all sorts of catgut and all the prep-

* For original article, see page 993.

arations of it in cases at all periods from directly after labor to thirty-four years after the primary injury.

DR. GEORGE ERETY SHOEMAKER.—I was one of the first if not the first to separately unite the bared ends of the torn sphincter ends by suture, the perineum and rectal wall being repaired by other suture series. The report was published in the Medical News of September 22, 1894 (Case VI). Dr. Charles P. Noble and Dr. Parke of this Society were present at the operation which was successfully done at the Methodist Hospital in June, 1893. The woman was a patient of Dr. M. K. Elmer, and two previous operations by the older methods had failed at another hospital.

Dr. Kelly illustrated the separate suture operation in the Johns Hopkins Hospital Bulletin of March, 1899, including the above among his references.

We long ago ceased to look upon this as an uncertain operation and approach it with confidence of success.

As to technic I continue to use fine silk interrupted sutures tied in the rectum for the rectal wall. The perineum is closed with chromicized catgut and covers up the united sphincter. Denudation of the ends is essential. Primary stretching is important.

There is another variety of impaired sphincter in which it is more difficult to get a good result, namely, where the muscle has been improperly cut in an oblique direction when operating for fistula in ano. It is here more difficult without great sacrifice of tissue to isolate the tapered sphincter ends imbedded in the scars of chronic inflammation. The clean tear produced in labor leaves better tissue to work with.

DR. JOHN M. FISHER.—In most of these cases Ristine's apron operation as modified by Watkins gives good results. This procedure is adapted to the average complete laceration and more than any other obviates the possibility of wound contamination from the rectum. In recent cases I always close the rent in the bowel with catgut as demonstrated on the board, uniting the overlying structures with one or two buried continuous sutures. I likewise employ catgut in the repair of old lacerations and rarely find it necessary to use anything than No. 0. The trouble with most surgeons who complain of catgut in plastic work is they do not use properly prepared material. The dry hard chromicized catgut in envelopes has twice the tensile strength of the gut in tubes and in the vagina I have found it unabsorbed as late at two and in some cases three weeks after the operation.

DR. MCGLINN.—I wish to endorse what Dr. Fisher has said about the Ristine operation in tears involving the sphincter and extending into the rectum. I have been using it exclusively in this type of laceration for several years and have not had a failure. In reference to the management of the bowels, it is my practice to give a laxative the day following operation and to continue its use in order to obtain a movement each day.

DR. S. E. TRACY.—It is not necessary to place sutures in the rectum when repairing a complete laceration of the perineum.

It is much better to dissect the bowel sufficiently free to bring the upper end of the laceration below the sphincter muscle. Such a technic precludes the possibility of leakage through the suture line in the rectum, and of the formation of a rectovaginal fistula. I have used this technic not only in cases of complete laceration of the perineum, but also in cases of rectovaginal fistula following complete perineorrhaphy, where the bowel had been sutured; and in cases of simple fistula in ano, with uniformly satisfactory results and can recommend it as a simple and efficient procedure in such cases.

DR. GEORGE M. BOYD reported a case of

COMPLETE INVERSION OF THE UTERUS AND VAGINA.

Complete inversion of the uterus and vagina is an extremely rare accident following labor. The writer has seen in consultation several cases of incomplete inversion of the uterus, but in the case to be recorded both the uterus and vagina were completely inverted and prolapsed. The uterus protruded from the vulva as a large bleeding pyriform tumor and to this mass was attached an adherent placenta. The history of the case was as follows: Mrs. H. L., a multipara, aged twenty-eight years, was admitted to the Medico Chirurgical Maternity, February 24, 1912. She had had two previous labors, both instrumental and there existed great relaxation and laceration of the lower birth canal. In her third pregnancy she engaged the services of Dr. J. H. Donahue. She went into labor at term, February 23, 1912. Again, it was necessary to deliver her with forceps, which operation was performed on February 24, at 5 A. M. The operation was not very difficult and soon she gave birth to a healthy female infant weighing 9 pounds, a free bleeding following the delivery. In compressing the uterus, after the usual method of treating the third stage of labor, suddenly and spontaneously the fundus left the operator's hand and the uterus and vagina turned completely inside out. The whole mass was prolapsed, hanging between the patient's thighs and to this was attached a firmly adherent placenta. The hemorrhage now became alarming and continued until the placenta was detached. An attempt was made to reposit the uterus, but was only in part successful. The vaginal inversion was reduced and the uterus returned to the pelvis, but the organ still remained inverted. The patient was admitted to the Medico Chirurgical Hospital, February 24, 1912 at 10 A. M. The inversion had now become subacute. The patient's general condition was bad; her pulse was 136 and weak and her temperature subnormal. A large bleeding mass presented at the introitus. This mass completely filled the pelvic cavity. At 12 o'clock, seven hours after her delivery, the patient was anesthetized and an attempt made to reposit the uterus by taxis. Although persisted in for sometime this method of treatment was unsuccessful. We then performed an abdominal section, which revealed a crater-like excavation in

place of the rounded uterine body. The inversion of the uterus had engulfed the appendages with the exception of the fimbriated extremities of the tubes, the same appearing on either side of the depression. There was no blood found in the peritoneal cavity, nor evidence of extensive laceration of the broad ligaments. With the abdomen opened it was easy to make pressure from above the point of constriction and by the bimanual method the inversion of the uterus was easily reduced. A left lateral laceration of the cervix was now discovered. It was, however, not extensive and immediately repaired. A uterine douche was given and finally the organ was firmly tamponed with sterilized gauze.

The postoperative history was uneventful. Her pulse remained rapid for three or four days and she had a slight elevation of temperature, probably anemic in origin. She gradually gained in strength and was discharged in the third week of the puerperium fully recovered.

DR. BOYD also reported a case of

MELENA NEONATORUM.

The babe was born on February 10, in the Lying-In Charity. The mother was healthy in every respect. There was rachitic history. The child was full term, a well-formed female. No evidence of disease at birth. On the morning of February 13, she had a profuse hemorrhage from the bowel at 5 A. M. There was an amount of blood sufficient to soak through the crib. The diagnosis of melena neonatorum was made and the infection of blood serum resorted to. It was impossible to secure a donor and we therefore used the serum taken from the blood obtained from the cord of a recently delivered placenta. From 2 to 3 minims to a dram were injected at a time and after the second or third hypodermic injection the hemorrhage ceased and the baby recovered. Whether this was coincident or due to the fact that we added to that baby's blood a fibrin making power which the new strain possessed we are unable to say. There have been a number of cases, however, reported recently. The result in this case was so pleasing that I felt a report would not be without interest.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of March 28, 1912.

F. A. DORMAN, M. D., *in the Chair.*

DR. A. ERNEST GALLANT reported three cases:

I. OVARIAN DERMOID LYING IN THE RIGHT FALSE PELVIS WITH INTRAUTERINE PREGNANCY.

The patient, a nullipara, aged thirty-seven, had been sent by Dr. Prudden on December 4, 1911. Her last menstruation had occurred on September 4. She gave a history of having had "trouble on the right side" eleven years ago and seven years ago had been in bed for ten weeks with peritonitis. Examination showed a large kidney-shaped mass in the right iliac fossa, semifluctuant, which had been palpable for the past two or three weeks. It seemed to the patient that the mass varied in size. Owing to the presence of a palpable right kidney prolapsed 3 inches and palpable above the other mass it was thought that the tumor must be either a misplaced pyosalpinx or an ovarian cystoma, and in order to cause as little disturbance to the fetus as possible, early operation was advised. Through an oblique incision a cystic mass was found bound down by very tough bands, extending in every direction and difficult to displace. During the operation the cyst ruptured and 3 or 4 ounces of a fatty substance escaped. The base was formed by the broad ligament and the sac was filled with hair and sebaceous matter. The convalescence was simple and the pregnancy went to term without incident. The tumor measured 3 inches by 3 inches and was flattened not unlike a kidney.

II. DERMOID OVARIAN CYST.

The patient was a nullipara, aged twenty-three years, who had suffered for over a year with right-sided pelvic pain. The cervix was anteflexed, the fundus twisted to the left and fixed by a tumor the size of an orange which filled the right culdesac.

On February 14, 1912, the cervix was dilated and a rubber drain sutured into the cervix. On entering the peritoneal cavity through the left rectus sheath, the omentum was found adherent to the parietal peritoneum, and the bladder, uterus and whole pelvis were held by bands many of which had to be cut or forcibly torn in order to free the prolapsed, adherent

left ovary. The right tube and ovary were elevated, the former ruptured and considerable cheesy matter escaped. These were removed and the broad ligament sutured *en masse*. The appendix was also taken away. The patient recovered after a somewhat stormy convalescence.

III. RUPTURED ECTOPIC WITH MUSHROOM BLOODCLOT ATTACHED TO FUNDUS UTERI BY A SMALL PEDICLE.

This case he had seen on February 7, 1912, at the request of Dr. Kittell. The patient was thirty-one years of age and had been married twelve years. She had had one child and menstruation had seemed normal in December. In January it was less than usual. She had had some vaginal discharge for three months and on February 3 she was seized with cramps, air hunger and collapse, falling to the floor and remaining unconscious for some time. In spite of the administration of codeine, the cramps continued until February 7 with diminishing evidences of shock. At this time her abdomen was tensely distended, contained fluid with a central tympanic area. The stomach was considerably distended with gas and about midway between the umbilicus and the pubes was felt a firm nodular mass extending across the hypogastrium. The mass was about the consistency of fibroids. The right side of the pelvis was filled by a boggy indeterminate mass and the uterus could not be defined. The large tumor was freely movable and on the left side ballottement was easily elicited. A diagnosis of ruptured ectopic or rupture of the stomach with fibroid uterus was made. On the following day the abdomen was opened and about three pints of bloody fluid escaped. There were no clots and no adhesions in any part of the abdominal cavity except at the left extremity of the tumor, where the omentum was adherent by a very slender pedicle 4 inches long. The large mass was firmly attached to the fundus uteri by a very strong tough base about three-quarters of an inch in diameter, and in freeing it a small portion of the uterine tissue was cut away. This area was very vascular and was closed by a continuous catgut suture controlling the bleeding and approximating the peritoneal surfaces. In the left culdesac was a mass of tissue not unlike exudate and with the ovary was lifted out; the latter was ligated *en masse* to stop bleeding. The right tube was tortuous and contained a small quantity of clear fluid. The left tube seemed normal. The cavity was sponged dry and closed. The patient's condition was good and she made a rapid recovery returning to her home twelve days later. The specimen presented was made up of numerous blood sacs, some ruptured during removal and the bulk of the mass consisted of blood fibrin which had clotted in this most extraordinary way. The base showed the small portion of the uterine tissue and a sort of cavity in which the fundus was imbedded before removal. On the left extremity was a sac which resembled a fetal shell, though no sign of a fetus was discovered.

DISCUSSION.

DR. F. A. DORMAN had seen a number of ovarian dermoids which complicated pregnancy and, on several occasions, operation was not necessitated because of a loosening up on the pedicle which permitted the child to be born without interference at time of labor. In one particular case he was positive that he had to deal with a double ovarian dermoid; he felt confident of this because of the characteristic conditions noted, *i.e.*, the ridges of cartilaginous tissue. He could recall three cases at least where he was convinced by both observation and touch that he was dealing with a double ovarian dermoid. He dreaded the effect of the rupture of contents of the dermoids because they were so prone to produce a peritonitis. He was convinced that this material would lend itself to favoring the growth of germs and greatly enhance suppuration in the peritoneal cavity.

DR. S. W. BANDLER said it was generally considered that the contents of a dermoid cyst were extremely infectious and that it was rather a disagreeable complication to have the contents of such a cyst poured out into the peritoneal cavity. It might be hard to understand just how such contents could contain bacteria but it seemed probable that the cheesy material produced additional annoyance by chemical irritation and represented a foreign substance difficult of absorption.

He was called to see a patient supposed to be four months pregnant, suffering from pain which was diagnosed as due to impending abortion. The patient had two large dermoid cysts, one with a twisted pedicle. Operation was followed by complete recovery.

He also reported a case he had recently operated upon, a young girl of 19 years who had the largest abdominal tumor he had ever seen in a young person. It was a cyst which extended up on the right side almost to the liver and on the left side, almost to the umbilicus. It proved to be multilocular cystadenoma. Many of the sacs were opened before the tumor could be removed. Subsequent examination showed, after still other cysts were opened, deep in the center of the tumor a harder sac filled with cheesy matter, hair and bone. Had this tumor not been examined so thoroughly the dermoid character of the tumor would have escaped observation.

DR. H. S. STEARNS reported a case of toxemia of pregnancy with predominant characteristics of vomiting and icterus, and postmortem, focal degenerative areas in the liver.

Patient A. P., Bohemian, æt. twenty-four years. One previous pregnancy five years ago. As far as could be learned this was uneventful, but this part of her history is unreliable as an efficient interpreter could not be found. Last menstruation the end of October, 1911. Vomiting began about December 10, associated with pain in the epigastrium.

When first seen, Jan. 19, 1912, she was slightly emaciated, and distinctly jaundiced, with normal temperature, respirations 28,

and pulse 136, small but perfectly regular. Everything taken by mouth, even water was quite promptly ejected. She was placed on nutrient enemata and the necessary amount of fluid furnished by a "Murphy drip." At the end of a week the pulse had improved in quality and dropped to 120. Feeding by mouth was started carefully with peptonized milk and albumen water. For three days no vomiting, quantity by mouth being from $\frac{3}{4}$ vii to $\frac{3}{4}$ xiv in twenty-four hours. Jaundice about the same. On Jan. 29 the urine suddenly fell to $\frac{3}{4}$ x in twenty-four hours, no albumen or casts. This was brought back promptly to $\frac{3}{4}$ xxx by increasing the fluid per rectum. Vomiting now became uncontrollable again and although the pulse was ranging about 100, it was decided after consultation to induce an abortion. It was believed the patient's strength was quite sufficient for the usual methods to succeed and she need not be put to the risk of an anesthetic and a rapid emptying of the uterus. All means failed, however, to elicit the faintest sign of uterine contractions and early in the morning of Feb. 2 she died rather unexpectedly, her condition the evening before being no worse than during the last three days.

The interest centers particularly about the pathological conditions in the liver. Microscopical examination shows an advanced stage of focal degenerative areas, which are strictly limited to the central lobules in the immediate vicinity of the central vein. There is no increase of connective tissue outside of the areas of necroses. Capillaries are moderately distended and there is quite an advanced disintegration of the endothelial lining. Many of the endothelial cells are free in the capillary spaces, some being actively phagocytic, containing bodies of disintegrated cells, some red, some white and some granular detrites. The areas of focal necroses are of irregular size, some microscopical, taking up only part of the field under oil immersion lens. Other areas are so large as to take up half or three-fourths of a lobule. In these necrotic areas the continuity of the liver cells, in their normal relations, is entirely lost and replaced by a granular detritus, composed of dead vacuolated liver cells, the majority of which contain sharp, golden brown spicules. Many liver cells are devoid of nuclei, and show advanced stages of acute degeneration. The liver cells in the peripheral parts of the focal areas of necrosis show advanced swelling, with eccentric nuclear arrangement, containing in many cells a brownish-black pigment not unlike bile. The capillaries in the immediate vicinity are distended and the epithelial lining has disintegrated. The liver tissue seems, however, in the peripheral parts of the lobules to be fairly normal. The central vein, in many of the areas of focal necrosis, seems to be entirely obliterated, not only by a granular swelling, but by advancing pressure in the surrounding necrotic zones. The sections from this liver show but one phase of the acute degenerations of the liver which have been described as occurring in various toxemias of pregnancy, in death

occurring at different times during the stages of the disease. It therefore belongs to and is a very representative type of an acute atrophic degeneration of the liver, not unlike those which have been described as acute yellow atrophy of the liver from various causes, both exogenous and endogenous.

DR. SAMUEL W. BANDLER reported a case that had been under his observation about four years ago. It was a well-marked case of pernicious vomiting. The patient seemed to be doing well under treatment but developed a decided jaundice. He immediately performed a vaginal Cesarean section and emptied the uterus and the patient made an excellent convalescence.

In the case of nausea and pernicious vomiting of pregnancy the introduction of saline to the amount of one quart or more daily per rectum, in small amounts repeated several times a day, or by the Murphy drip, is the most ideal form of treatment.

He was glad to see that the method of rectal feeding had been used in Dr. Keator's case. It was remarkable, however, to observe how patients would improve, and not lose much in weight and general appearance, if they would go on day after day absorbing a quart or two quarts of saline, even if the amount of nourishment taken per os or per rectum was very small.

Dr. Bandler thought that it was a rather grave responsibility to decide when the gravid uterus should be emptied; that many cases which seemed not to be doing well, would, with the exercise of patience eventually be able to take nourishment and go on to full term with very little annoyance. He thought it would be a rather hazardous thing to allow a pregnancy to continue once a jaundice developed in association with pernicious vomiting.

DISCUSSION.

DR. F. A. DORMAN said that Dr. Stearn's case was rather a peculiar one because there was but little atrophy of the liver and the course of the disease was so chronic. Occasional improvement in the patient's condition led one to hope that something might be accomplished by treatment but it was a false hope. This was a case, in his opinion, of typical acute yellow atrophy. No petechial spots appeared. Before death the patient was conscious.

He thought that the report of Dr. Keator's case was of exceeding interest.

DR. ASA B. DAVIS said the reading of the paper brought to his mind two interesting cases.

CASE I.—This patient came into the Lying-In Hospital in the fifth month of pregnancy and had very persistent vomiting; she was much emaciated and had a sallow greenish complexion. The treatment at first was rest in bed, rectal feeding, hot baths, nitroglycerine, no food by mouth, saline enemata, etc. There was no apparent improvement for a few days; then she was able to take peptonized milk, half-ounce doses several times a day. Gradually mouth feeding of this kind displaced rectal feeding and

the patient left the hospital at the end of two weeks in greatly improved condition, able to be about and take regular diet. She was instructed to report in person at intervals and to let us know at once if she were not doing well. She failed to do this until nearly a month had passed when she applied for readmission saying that she had been very ill for a week, although well prior to that time. Her condition was worse than when first in the hospital. Vomiting of large quantities of dark fluid was persistent. Treatment as before was begun. The stomach was washed out. This was soon followed by the vomiting of about six ounces of bright blood. She did not respond to treatment to any extent. Labor was induced by packing gauze into uterus cervix and vagina, three days after admission. Hematemesis was checked for a time, then became more frequent and larger in quantity—as much as 8 to 10 ounces of clear blood coming up at a time. Having in mind Dr. J. E. Welch's work with human blood serum, 30 c.c. was given this patient subcutaneously immediately after a large hemorrhage from the stomach. There was no further sign of hemorrhage after the first injection although two others were given about ten hours apart. A premature child which had been alive shortly before was still-born. Patient left hospital ten days later in good condition.

CASE II.—This was a patient that Dr. Davis saw in the earlier months of pregnancy and she also led them to believe that she would get well, but she suddenly grew worse and emptying the uterus was necessitated. But this did not stop the vomiting, and she grew worse and worse until she was almost moribund. There was no hemorrhage in this case whatever. Serum was given and there followed a gradual improvement. Her husband and a number of friends donated about eight quarts of blood the serum of which was used in a period of about one week and recovery followed in a case that was supposed to be absolutely hopeless.

Paper of the evening:

THYROID PHYSIOLOGY IN ITS RELATION TO PREGNANCY.

DR. S. P. BEEBE said that there was one point of interest in regard to thyroid physiology and that was that there was a limit to the functional capacity of the thyroid gland. Of course they saw in a number of cases symptoms showing over and under activity. Where there were ten times as much thyroid tissue as was found in the normal animal, for health it needed a very normal function of the thyroid. When occasion arose to give thyroid as a medicine, it was found that patients varied tremendously in regard to their susceptibility. Experiments had shown that thyroid function varied and increased during pregnancy; there seemed to be an increased demand for thyroid function at this time. During pregnancy there was but a small increase in the size of the thyroid gland, and sometimes it failed to return to the normal size after pregnancy. During pregnancy

they knew that there was a marked change in the physiological conditions in the animal, a change which called for an increased demand for oxygen; there was an increase in the bulk of the uterus, an increased activity just as was called upon by the liver, the kidneys, the digestive organs, and so forth. There was this increased demand for oxygen; the metabolic activity called for an increase for thyroid function. They all know that it was possible to produce experimentally in animals at birth thyroid glands in a pathological condition. If they removed a considerable portion of the gland of the mother before the beginning of pregnancy, depriving the mother of her proper amount of iodine, a large percentage of the offspring, at the time of birth, would be without a normal gland and would soon develop symptoms which went with deficient thyroid function. Recent research, especially in Wisconsin, have shown that in cattle, dogs, sheep, pigs and other animals abnormal glands could be produced experimentally, not only abnormal as regards their histology and anatomy, but in regard to certain functions and all showed but a small amount of iodine. Many of them had hyper- and many hypo-function. The question arose how to explain these cases. The thyroid gland was certainly whipped into increased activity during pregnancy. A considerable percentage of cases of Graves' disease dated their development from some definite pregnancy when the thyroid gland increased in size. At the termination of the pregnancy the symptoms became very marked and there occurred an acute development. In cases of Graves' disease, when pregnancy developed, the patients were usually better during their pregnancy than before; the thyroid secretion was increased and they seemed to do much better.

On the other hand the process might go so far that the patient with fairly well-marked symptoms of Graves' disease showed toxic phases which demanded the administration of thyroid during pregnancy. At the termination of pregnancy she would be able to carry on the demands made and she might have more thyroid than she needed. Patients who were myxedematous were not likely to go through pregnancy; they were likely to suffer from the toxemias of pregnancy. Furthermore they were not likely to be strong and healthy.

Dr. Beebe reported the case of a woman who had symptoms of deficient thyroid excretion when not pregnant. She became pregnant and her child died shortly after its birth. There was a persistence of the thyroglossal duct. The child died as the result of an infection. Two years later this patient became pregnant and gave birth to an apparently healthy child but one year later developed symptoms of cretinism. This was four years ago. She was under thyroid treatment but the symptoms continued even under this treatment. She became pregnant for the third time. She then took small quantities of iodine and thyroid extract and her third child was born apparently healthy in all respects.

This brought up one of the most interesting questions in reference to the toxemias of pregnancy. Little experimental knowledge had been obtained regarding the function of the thyroid gland. Many observations had been made, however, in animals on the results when thyroid gland had been given in excess; likewise upon animals in whom the thyroids had been removed. But when they pursued the mechanism which caused these results, they had obtained very little knowledge. In the toxemias of pregnancy almost immediate relief was obtained by the administration of thyroid and he reported one instance. A girl of nineteen years at the termination of full term was taken with convulsions. Little history could be obtained when she entered the hospital except that she had been quite sick for eight or nine months. Her uterus was emptied but the convulsions continued. She had a high blood pressure and there was a small quantity of albumin in her urine. There was no jaundice. She was given hypodermically 5 c.c. of a 1 per cent. solution of thyroid gland and immediately her blood pressure was lowered, within one hour. Her temperature was reduced from 105° F to 102° F. and no more convulsions occurred until two hours later. Then both the blood pressure and the temperature went up. Thyroid was again given and down came the blood pressure and the temperature. She made a satisfactory recovery. Dr. Beebe had four other cases that behaved much in the same way and with the same results.

With regard to the giving of the thyroid, the human thyroid should be administered hypodermically. Qualitatively and quantitatively there was no question but that better effects were obtained by giving the thyroid gland from one of his own species. It was better to give a preparation not made by grinding the gland, because it contained substances not wanted and sometimes substances which were positively harmful. Small quantities could be used and with little toxic effect.

DR. SAMUEL W. BANDLER said that a great injustice had been done the female sex by attributing so many conditions to "nervousness," neurasthenia and hysteria, or to reflexes sent out from the genital tract; when, as a matter of fact, a very large proportion of these cases were suffering from nothing but hyperthyroidism.

Too little attention has been paid to minor degrees of thyroid involvement. It seems a fixed idea in the minds of medical men that, unless the classic symptoms of Basedow's disease were observed, viz., exophthalmos, goitre, tachycardia, hyperthyroidism could not be diagnosed. It left out of consideration the tremendous number of patients who suffer from gastric and nervous symptoms, with varying degrees of tachycardia and tremor, in whom there was no exophthalmos, and in many of whom there was slight if any enlargement of the thyroid gland.

Dr. Bandler took the view that the secretion of the ovaries

bore a decided and antagonistic relationship to the secretion of the thyroid; an oversecretion of the ovaries might overstimulate the thyroid. On the other hand, if the ovaries failed to secrete normally and the thyroid worked well, there was then a relative hypersecretion of the thyroid substance, and we had what might be called a relative Basedow's disease, or simple hyperthyroidism. The relationship between the ovaries and thyroid was observed at puberty, during menstruation, during pregnancy, and certainly at and after the climacterium.

Dr. Bandler gave this relationship between the ovaries and the thyroid as an explanation for the swelling of the thyroid before menstruation, and its swelling during pregnancy. During pregnancy the ovary contained a corpus luteum and this secretion, among other things, by stimulating the thyroid probably caused its enlargement.

He would like to ask Dr. Beebe to mention his explanation of the swelling of the thyroid during menstruation and during pregnancy, and to state why thyroid diseases were so much more prevalent among women than among men.

REVIEWS.

NEW AND NONOFFICIAL REMEDIES. Price, Cloth, \$0.50; Paper, \$0.25; Pp. 298. Chicago: American Medical Association, 1912.

This book contains descriptions and a statement of the actions and uses of all articles which have been examined and accepted by the Council on Pharmacy and Chemistry prior to Jan. 1, 1912, for inclusion in the list of New and Nonofficial Remedies.

The work of the Council during its seven years of existence and the reports of the Propaganda Department of *The Journal. A. M. A.* have convinced the physician that in the prescribing of proprietary remedies he must be more careful in his selection of those which he directs for his patients. Nowhere else can the physician or the pharmacist turn for reliable, unbiased information concerning the new remedies. This book enables the physician to make such selection and the careful pharmacist to know the character of the remedies he dispenses. It should be in the hands of every one of them.

SURGERY OF THE DEFORMITIES OF THE FACE INCLUDING CLEFT PALATE. By JOHN B. ROBERTS, A. M., M. D. Professor of Surgery in the Philadelphia Polyclinic, Surgeon to the Methodist Hospital, Formerly Assistant Eye and Ear Surgeon to the Children's Hospital, and Demonstrator of Anatomy in the Philadelphia Dental College. Illustrated with 273 Figures. New York, William Wood and Company, 1912. Price \$3.00 net.

Dr. Robert's book is a very complete and interesting manual, which records the enormous progress made in this domain of

surgery within comparatively recent years. Plastic operations on the face should not only be done for cosmetic effect but there are many other reasons why such repairs should be made, including the favorable mental effect on the patient. The plastic operations on the face are usually successful to an astonishing degree, because the circulatory conditions aid greatly in the accomplishment of proper healing and therefore favor the final result. Dr. Roberts, after an introductory chapter on the historical development of his subject, devotes several chapters to the anatomy of the face, the characteristics of the surgery of this region, the principles of plastic operations for the correction of congenital and acquired deformities. Considerable space is given to the correction of harelip and cleft palate, which constitutes probably the most frequent class of cases for which corrective operations need to be done. The results obtained by the methods of Lane and Brophy certainly speak for a favorable consideration of these methods. The book is most satisfactorily illustrated and is a very valuable contribution to surgical literature.

HOME HYGIENE AND PREVENTION OF DISEASE. By NORMAN E. DITMAN, M. D. New York, Duffield & Company, 1912. Price,

It has often been said in criticism of books of this class that the distinction between what the laity ought and ought not to know about medicine and its application to themselves, is a most difficult one to draw. In the present instance, Dr. Ditman states very clearly in his preface what his book aims to do, but the contents of its pages show many glaring inconsistencies. The title of the book is hardly borne out by its contents and it is a matter of surprise and regret that the material contained therein which might be of value to the lay reader, should be so prejudiced by descriptions and recommendations which can only be regarded as of doubtful import, if not worse. There is no doubt whatever, that the prevailing intelligence of the present day demands a more correct appreciation by the individual of his physiological activities, but whether this knowledge should be advanced to include the interpretation of symptoms of illness and their treatment, is very questionable. The disinterested reader, lay or medical, cannot help but acknowledge after reading its pages, that much of the information and advice contained in Dr. Ditman's book favors self-drugging of a kind which is dangerous and should be eliminated rather than suggested. It seems somewhat inconsistent that the efforts which are being made to educate the laity not to dose themselves with proprietary preparations, should be made useless by the recommendations of a reputable practitioner to employ certain powerful drugs which are regularly incorporated in the *materia medica*. The author states that nearly all the medicines mentioned in his text, except those marked "poison" may be "obtained from licensed drug-

gists without the prescription or signature of a medical man." It is very questionable, however, whether sulphonal, paraldehyde, trional, caffeine, antipyrin and similar drugs, can legally be purchased from a druggist without a prescription. An instance of the very doubtful advice given in numerous places throughout the book, is that a patient afflicted with chronic Bright's disease may take 20 grains of sulphonal, or one dram of paraldehyde or 5 grains of trional for the alleviation of insomnia and 5 grains of caffeine with 2 grains of antipyrin when headache is violent. Less dangerous and rather amusing are the directions for taking care of the hair and complexion, which in some respects read very much like the advice contained in the "beauty columns" of some of our yellow journals. A choice of remedies is recommended for improving the quality of the hair "superior to those sold in the shops" and directions are also given for making the hair curl. Dr. Ditman's book would find a wide circulation among a very large proportion of our population, if it likewise contained the welcome information regarding some remedy to take out the curl. It would appear as if the author had missed his opportunity for giving good advice in cases where this might be safely administered. Thus, the important subject of miscarriage is dismissed in a few brief paragraphs which discuss the etiology but offer no knowledge or sensible suggestions as to prevention or what ought to be done in the presence of this accident before the doctor arrives. Dr. Ditman's book contains a great deal of valuable information for which due credit must be given, but it would meet with much greater approval among the medical profession and would probably be recommended by them more widely, if the errors referred to, together with many others of a similar kind could be eliminated in future editions.

CANCER OF THE UTERUS. (*Zur Kenntniss des Uteruskarzinoms.*) A monographic study of its morphology, development and growth, with contributions to its clinical aspects. By J. SCHOTTLAENDER and F. KERMAUNER, of Vienna. With 268 illustrations in the text, and 16 plates. S. Karger, Berlin, 1912.

Seldom has a work appeared with the high scientific ideal of that of Schottlaender and Kermauner, on "Carcinoma of the Uterus." Its plan was conceived by the late Alphons von Rosthorn, to whom the work is reverentially dedicated. Von Rosthorn was to have developed the anatomical and clinical features, while Schottlaender was to discuss the histology. As a whole it was to be a comprehensive study of uterine cancer, with the hope that a mass of definite data could be gathered, which would serve to make this dread affection more readily recognizable, and hence more readily attacked.

There have been published, since this work was begun, a number of books on its subject; but in no instance has there been a happier union of authors. Von Rosthorn's anatomical studies

in other subjects have been held up as models of scientific description and observation; and in this his associate, Schottlaender, also shared. While the histological contributions of the latter have marked him as one of the foremost pathologists in this special field, he has more than once expressed his indebtedness for his anatomical knowledge and training to von Rosthorn, his avowed master. With the untimely death of von Rosthorn, it fell to his favorite pupil, Kermauner, to complete the clinical and anatomical investigations.

With two scientists of the caliber of Schottlaender and Kermauner, the present work could not but satisfy the highest aspirations. The work is notably impartial. There are no pet theories of the authors. The individuality of each is entirely submerged in the critical survey of the literature. In the words of the authors, "they have tried to be altogether objective," they have drawn from their studies only natural, logical conclusions. In the material, which was years in collecting, there have been numerous defects; these have been especially referred to in the book and taken account of in the conclusions.

The work is based upon the study of 135 cases of uterine cancer operated on in von Rosthorn's clinics, at Graz, Heidelberg, and Vienna. There are five additional cases of a more or less positive primary carcinoma of the vagina, and two cases of uterine tumor, one of which may be included in the group of carcinoma, the other not classified.

This constitutes a relatively small proportion of the entire clinical material. The relation between this material and that serving for the anatomical investigation is given in tabular form.

The investigations concern themselves with the morphology, microscopic and macroscopic of uterine carcinoma. An attempt is made to determine the anatomical primary focus and the formal histogenesis; also the mode of development of the cancer and its propagation in the uterus as well as in the neighboring tissues and organs.

With the anatomical findings the history of the case is presented briefly. In the clinical findings special attention is paid to localization whether the cancerous tumor was exo- or endophytic in type and the condition of the sacrouterine ligaments and parametrium. In the notes of operation attention is paid to the relations of the bladder and ureters to the cancer; to the condition of the pelvic glands; to the presence of pre-operative or postoperative fever; and to the condition of the scar.

In the fatal cases the chief data are given as found at autopsy. The fresh specimens were never cut open, but immediately put into 4 per cent. formalin or, occasionally, in Kaiserling solution. Formalin was sometimes further injected into the substance of the uterus and into the mucosa to secure better hardening. The macroscopic appearance of the uterus and adnexa is given in each case. The sagittal section was mostly employed. Special attention was given to the invasion into the vagina. The lymph

nodes were scrutinized for suspected carcinomatous invasion, whether these were in the parametrium, or of the iliac, or hypogastric groups. In recurrences, special attention was given not only to glands, but also to vagina, bladder, and ureters.

The microscopic findings are detailed in the description of each case. Careful notation of the blocks was made to facilitate orientation. Detailed descriptions are given of the findings in the uterus and adnexal lymph nodes, and, where the invasion was more widespread, also in the bladder, ureter and vagina.

Von Rosthorn from the beginning carried out the so-called radical operation, based upon correct anatomical preparation of the pelvic connective tissue. His technic since 1905 conforms with that of Wertheim. The duration of the operation depends entirely upon the extent of the lesion. In the average cases it was one hour; in more difficult cases one and a half to two hours.

Clinical Statistics Relating to Radical Carcinoma Operations.—The total number of cases of cervix carcinoma admitted to the clinics at Graz, Heidelberg, and Vienna, from April, 1899, to March, 1910, was 677. Graz, 347; Heidelberg, 134; Vienna, 196. Patients admitted but refusing operation are here included. In all cases the diagnosis of carcinoma was confirmed by microscopic examination. Operability of the cases was estimated at 57.22 per cent.

The total number of corpus carcinoma was eighteen. These are not included in the list.

Graz, 347 cases. Abdominal operations, eighty-five. Vaginal, forty-one. High cervical amputations, two. Operations refused, eight.

Heidelberg, 134 cases. Abdominal operations, seventy-seven. Vaginal thirteen. Operations refused, fourteen.

Vienna, 196 cases. Abdominal operations, ninety-four. Vaginal, twelve. Operations refused, ten.

It will be seen that the abdominal operation has been employed to a greater extent in later years. Von Rosthorn had preferred this route from the very start.

It will be of interest to note that cystoscopy before the radical operation was misleading and in the opinion of the authors is not to be depended upon.

Mortality.—Two hundred and fifty-six abdominal operations, forty-six deaths—18 per cent; this corresponds to about the average general mortality, *i.e.*, 2782 cases, 505 deaths—18.15 per cent. Lumbar anesthesia, limited operability, and exploratory laparotomy have decreased the general mortality to 10 per cent. in later years.

Duration of the Pre-operative Symptoms.—Cases in which there were symptoms of one to three months duration, ninety-four cases, of which ten died—10.64 per cent. death rate.

Three to six months duration, eighty-three cases, of which eighteen died—21.66 per cent. death rate.

Six months to two years duration, seventy-nine cases, of which nineteen died—24.05 per cent. death rate.

Up to one month duration, twenty cases, 8.9 per cent. of total number.

The cause of death in one-half of the cases was infection, *i.e.*, peritonitis, pelvic suppuration, and septic phlegmons. Excochleation treatment with formalin, the use of the rectangular clamps, nucleic acids, antistreptococcus serum, and vaccination have proved disappointing.

Hemorrhage.—Hemorrhoidal veins, gluteal veins and those of the levators when encountered are apt to give a great deal of trouble.

Accidents of the Operation.—Bladder injured in forty-one out of 256 cases—16.17 per cent. Ureter injured in sixteen out of 256 cases—6.25 per cent. Rectum injured in five.

Through secondary necrosis: Bladder fistulæ sixteen cases—6.25 per cent. Ureteral fistulæ, eighteen—7.03 per cent. Intestinal fistulæ, six.

Recurrences.—The primary recovery after operation was 82 per cent. Figured with all the cases at the clinic it gives a general cure of 41.24 per cent. Of thirty-three cases of the Graz clinic, according to Schindler, 20 per cent. remained well, *i.e.*, 4.16 per cent. absolutely well.

Of the Vienna material eighty-four survived the operation; twenty-one showed recurrences—75 per cent. The absolute recovery (196 cases—twelve vaginal operations, 10 per cent. refused) is according to Winter, iii, 36.2 per cent. Most of the recurrences were local; in only four cases was there glandular recurrence.

The Results of the Anatomical Investigations.—In sixty-nine cases the macroscopic and microscopic findings were the same. There was nothing new in the histologic study.

In seventy-two cases the microscopic examination showed a good deal more than was apparent to the naked eye.

In two cases small myoma, thought to be carcinoma proved to be negative on microscopic examination.

In seven cases a small lesion, not detected by the naked eye, was discovered in one lip of the cervix.

In seven cases there was no sharp separation between the carcinoma and epithelium.

In one case a polyp proved to be cancerous, while three other cases turned out to be unsuspected cases of carcinoma, as revealed by the microscope. Where more than one part was involved the chief lesion was determined by the amount of parenchymatous invasion.

Cancer of the Cervix.—One hundred and twenty cases; eight involved one lip only. Three cases on sagittal section showed carcinoma in one wall only; cross-section showed carcinoma in the other wall as well. In 120 cases twenty-eight seemed to show carcinoma in one wall only, but in reality only eight cases,

or seven, were confined to one cervix wall as proven microscopically. If both walls are involved the anterior is apt to show the most intense growth. Schottlaender's cases prove this assertion of Rosthorn's. It is also apt to be on the right side in the ratio of 25:15.

In over 50 per cent. of cases (69:129) cervix carcinoma went up beyond the internal os, and into the corpus. *Clinically these were considered cervix carcinoma.* The parenchyma of the corpus was also involved in these cases. In 134 cases (not inclusive of eight corpus carcinoma) the vagina was free in seventy-two cases, *i.e.*, in 45 per cent. of cases the vagina is involved along with the uterus carcinoma. Of twenty-eight cases of early carcinoma in not a single instance was a genuine portio carcinoma demonstrable.

In seven cases there was a probable portio carcinoma; but in all of these cases an ectropium due to laceration of the cervix was present. It is possible that the origin of the carcinoma may have been at this point of everted (ectropic) mucosa. Nor has there been a case of pure cervix carcinoma in the series.

Absolute evidence that carcinoma may arise from the external surface of the portio is still lacking. But that rare cases do occur is not to be denied; they are not more common than primary vaginal carcinoma. *Where does the carcinoma begin?* It may be said that the great majority of cancers of the cervix begin at the anatomic external os. But even in this very young carcinoma the cervix mucosa as well as that of portio epithelium near the external os was already involved. In the great majority of cases, lacerations and ectropium were present. This supports Breisky's contention and is not new; also that of Theilhaber, that scar formation shows a tendency to carcinoma. It will be recalled that the Mayos have pointed out this connection between carcinoma ventriculi on the basis of an ulcer. In fifty-eight cases there was a cancerous surface deposit (endophytic growth). In thirty-four cases the cancer was of the exendophytic type. The most frequent cancer deposit was in the cervix. Extensive surface growth is a great rarity.

The term *ulcus rodens*, formerly employed to describe this variety of cancer growth, as such, does not, however, exist, according to Schottlaender's experience. Central cervix nodes (in the sense of Virchow's connective-tissue cancer) really do not exist; in five cases a connection—though limited—with the surface epithelium was demonstrable. The exophytic type of carcinoma leaves the corpus entirely free. The endophytic carcinoma may stretch into the body of the uterus (fifty-five times); this is also true when the vagina is involved.

The Parametrium in Cancer of the Cervix.—Of 120 cases (excluding corpus and corpus-cervix cases) seventy-four, showed parametrium invasion. But this varied in different clinical material; thus in Vienna only sixteen out of thirty-five cases showed invasion into the parametrium. But not only the

paracervical but also the anterior and retrocervical tissues were involved. This was naturally ascertained by use of the cross-section instead of sagittal section, which method was formerly employed alone. The strongholds are against further invasion are:

1. The longitudinal muscular layer.
2. Serosa.

The bladder in spite of its nearness is not frequently attacked. The exophytic carcinoma is less apt to form metastases in the parametrium.

The Lymph Nodes.—Twenty-three out of forty-eight cases examined showed carcinoma invasion. In sixteen cases only this had taken place on one side. Ordinarily, the iliac, hypogastric and sacral glands were involved but, as Rosthorn declared, the lower lumbar and retroperitoneal glands may also be affected.

The thoracic glands may also become infiltrated. In three instances the autopsy showed residual carcinoma glands that were not removed at operation. A sharply demarcated tumor is not necessarily free from lymph gland involvement. The ovaries were involved in two cases. The tubes were negative in cervix carcinoma.

In the one case of endothelioma the tubes were involved however. Of other changes in the genital organs, there were in the uterus:

Metritis.....	53 times.
Atrophic uteri.....	27 times.
Pyometra.....	8 times.
Hematometra.....	2 times
Myomata.....	22 times—18, 57 per cent.

Adnexa.—All stages of inflammation, only in twenty-six cases were adnexa free.

Carcinoma of the Body of the Uterus.—There were only seven pure corpus cases. In four cases there was metastasis in parametrium and ureteral glands. Therefore the same surgical treatment should be instituted as for cervix cancer. The pure cases of corpus carcinoma are apt to be multiple and circumscribed, and may be regarded as implantation cancer, as there is not always a direct connection between the cancerous alveoli.

Results of the Histologic Investigations.—Morphologically uterus carcinoma may be grouped into:

1. Solid carcinoma.
2. Primary glandular and partly secondary solid carcinoma.
3. A combination of primary solid and primary glandular.

The solid form of carcinoma consists of solid epithelial nests and arises from pre-existing squamous epithelium, metaplastic to prosoplastically changed cylindric surface epithelium of the uterine cavity or from glandular epithelium which no longer maintains the character of glands. They may also be classified according as to whether cells were present and cornification into ripe, middle ripe and unripe carcinoma.

In 115 cases the growth was of the primary solid variety.

In twenty-five cases it was of the positive or probable primary glandular type. The further classification into large, small and mixed alveolar of lymphatic or plexiform propagation, also medullary, scirrhus, and middle forms was employed to complete the description. The behavior of round cells, polynuclear cells, plasma cells, eosinophiles, mast cells, mitosis in connective tissue, elastic strands, retrogressive changes in the neighborhood of the cancer, such as lime, mucous, fatty, hyaline and necrotic, are described in a chapter on changes in the stroma. The endothelium of blood-vessels in the immediate neighborhood of the carcinoma takes an increased activity and proliferation.

The Formal Morphologic Diagnosis of Cancer.—In the opinion of the authors, contrary to Lubarsch and others, it is possible to diagnose early carcinoma even without the evidence of destructive growth.

In the material studied by the authors there are at least two early cases in which the positive diagnosis of carcinoma could be made. These were so young that they could easily escape suspicion, and were detected only during careful histological study.

The cells are altered either at the periphery of the cell nests (basilar layer), alone or altogether. The change consists in the greatest variation of number, size, form, staining, arrangement, as well as the relationship to neighboring cells, and finally to the surrounding or neighboring stroma. Changes in the nuclei are, however, more important than those observed in the cells. In the earliest stages of carcinoma they are apt to show the greatest variety in size and chromatin content. Giant nuclei are not uncommon. When these evidences are present in any given epithelium the presumptive evidence of malignant change is very strong. There need be no process formation, deep invasion, leucocytic infiltration, or destructive tendency. The carcinoma may spread along the surface of the uterine cavity and show no tendency to invasion of the parenchyma. This chapter is profusely illustrated and in dealing with perhaps one of the most difficult questions in pathological diagnosis, it must be of service to all who are engaged in the effort to establish the criteria for differentiating cancerous from simple metaplastic epithelium, and if not absolutely convincing, at least pave the way for the ultimate solution of this perplexing problem.

A splendid summary is given toward the close of the book, embodying some of the most important results of the entire mass of anatomical and histological research. I have attempted to give them here almost verbatim.

SUMMARY.

The majority of uterine cancers arise by primary cancerous conversion of any given portion of mucous epithelium. This conversion is the more readily understood if one assumes an

abnormal latent quality of epithelium dating from the embryonic period, and besides this general predisposition, certain forms of irritation as exciting factors.

More than four-fifths of all carcinomata are situated asymmetrically in the wall of the cervix, 6.7 per cent. exclusively in one wall. More than one-third occupy one wall partially, leaving one portion entirely free. In these cases the posterior wall is a little more extensively involved; in advanced cases this difference does not obtain.

The growth of the cancer is continuous or discontinuous; the latter mode of growth can be regarded as a metastatic form only when a zone positively free of cancer can be demonstrated between the cancerous cell-nests—a condition which is ordinarily not sufficiently considered.

The continuous form of cancerous growth is partly endophytic and partly exendophytic. The endophytic are the most frequent. Whether the exophytic growth exists purely as solid cancer has not been established. Pure exophytic glandular carcinoma do occur, but the exophytic phase rapidly disappears. The glandular cancers are more frequently exophytic than the solid form of cancer.

In the sagittal section the endophytic cancer appears to be differently demarcated above and below. The great majority show indistinct limitations. The macroscopic and microscopic findings in this connection do not coincide.

Besides the well-known deep invasion of uterine cancer, especially of the solid variety, there is a well-marked, continuous nonlymphatic surface growth and superficial surface growth which occasionally attacks the innermost confines of the mucosa, so that it may be found to be covered by a cancerous deposit.

The deposits may be present in the various parts of the uterus, especially in the corpus cavity, and here present occasionally though rarely the only continuation of an advancing cervix carcinoma. The deposits are frequently quite extensive, they appear to occur more commonly in ripe than in the unripe solid variety of cancer.

Metastasis of uterine carcinoma in the uterus itself could be assumed with reasonable probability in a few cases. At the same time in this connection the microscope was misleading.

Implantation metastasis in glandular carcinoma must be reckoned with. The point of implantation must however, show certain cylindrical epithelium for this to occur, a condition also requisite in the solid variety of cancer. For implantation upon squamous epithelium there has been no supporting basis. Multiple cancer formation in the uterus on the one hand, and in the adnexa in the other positively does occur; also multiple cancer formation in the uterus alone.

In a series of cases where vascular metastasis could be excluded partly implantation metastasis and partly multicentric cancer formation could be assumed. Such a condition can, however,

be confused by the presence of suppurative inflammation, and destruction of masses of carcinoma lying on the surface. In one case (V) an isolated cancerous ulcer on a lip of the cervix seemed to be caused by a retrograde dislocation of cancer cells by way of the blood stream.

A cancerous conversion of the healthy surface epithelium bordering upon the cancer foci probably does occur in the solid variety, although to a limited degree. In the glandular variety we have not seen enough material to express an opinion.

The corpus mucosa in cases of cervix cancer is capable of undergoing the cyclic menstrual changes even though secondarily involved in carcinoma. Endometritis in the sense of inflammatory infiltration of the stroma, has been observed independent of any cancerous disease. Among corpus and cervix polyps several were secondarily involved in cancerous change. One corpus polyp perhaps through implantation metastasis.

In about half the cases there was present an adenomyometritis. Tuberculosis was demonstrable in the corpus mucosa in only one case, and that independent of the cervix cancer.

An essential (inflammatory) metritis was present in only about one-seventh of the cases and was found most often when the corpus was invaded by the carcinoma. Among the numerous myomata which we have regarded in connection with the cancer only in the sense of a general disposition to new growth formation, one malignant growth was found. One positive cancer in the vicinity of the capsule, and one doubtful one. Repeatedly a proliferation of the serous endothelium in the form of glandular inclusions were observed.

In the vagina, which was involved in about 45 per cent. of the cases, a parenchymatous growth on surface deposit and a combination of the two forms were seen. The endophytic carcinoma are more frequent and attack the parenchyma of the vagina; while the exophytic carcinoma are rarer and are more superficial.

In the cancers involving the parametrium (74 per cent. of cervix cancers), there was almost always lymphatic propagation in the region of the uterus. At the same time we are rather inclined to assume that the growth was continuous and not discontinuous. If the limits of the uterus are exceeded by the invasion, this does not confine itself to the lateral tissues, but also invades the anterior as well as the retrocervical tissues. An isolated invasion of parametrium lymph glands, which occasionally may be very numerous, points in all probability to discontinuous growth.

Concerning the mode of invasion of the pelvic lymph nodes (43.25 per cent. in cervix carcinoma) the familiar viewpoints stand. But in these cases there is almost always evidence of lymphatic propagation in the mother cancer. In three cases the nodes were in parts markedly tubercular without evidence of cancerous disease. The glandular inclusions in the nodes

appear partly as altered lymphatics, whose endothelium may be said to have become cylindrical and partly, as in the case of those occurring in the parametrium, to have their origin possibly from the serosa.

The bladder musculature that may have been removed with the uterus is, as a rule, easy of recognition, occasionally, however, very difficult to recognize. As a guide to the diagnosis the net-like drawing of Sabotta may be of service. Positive evidence of carcinoma metastasis is to be seen in cancer nests between the muscle bundles. At the same time in the presence of "cornification tissue" without this evidence, the probable carcinomatous invasion may be assumed.

The involvement of the ureters is not quite as infrequent as has been represented. The ureter musculature, and occasionally the mucosa, becomes affected by means of the lymphatics from the parametrium.

The very infrequent cancerous disease of the ovaries in cervix cancer (concerning this relationship in corpus cancer we have no definite data) is produced exclusively through retrograde lymphatic transportation.

In the case of the tubes, which are more seldom attacked, the metastasis is brought about in the same way as in the ovaries with the exception that the invasion may be continued directly from the uterus, and probably by dislocation of cancer germs, (Krebskeimen), through the lumen.

Recurrences may be classified in two chief groups:

1. Indirect (Uneigentlichen).
2. Direct (Eigentlichen).

The second group from the viewpoint of the mode of development (?) into 1, those which have resulted from residual tumor particles, and 2, metastatic.

According to the localization, they may be grouped into:

1, Local, (wound or scar recurrence) which originate from the residual or implanted tumor cells, and infrequently through vascular dislocation, and 2, remote, including lymph node recurrence. In the latter instance, the mode of transportation is exclusively via the blood stream.

The direct recurrences which are here chiefly considered, occur in the great majority of cases upon the scar tissue or in the wound. One case however, of recurrence of the cancer in the abdominal parietes was probably metastatic and not due to implantation. In our series of cases there are two of lymph node recurrence.

In a series of uterus cancer (in our series six out of 135), in which the cervix and corpus are almost equally involved, it is impossible to say from which part the carcinoma originated. There are probably carcinomas which begin at the internal os and spread upward as well as downward.

In the great majority of cases of uterine cancer it is possible to determine whether the cancer began at the cervix or in the

corpus; but not so in the case of portio or cervix cancer. A portion of the cervix cancer cases has its source in the vicinity of the external os. In a relatively small number of cases it is possible to say whether the cancer had its beginning at the portio or at the cervix.

For the determination of the point of emanation of carcinoma in all cases, the following points are of service:

1. The situation of the tumor, *i.e.*, where the greater portion of the tumor lies.

2. The mode of development, *i.e.*, the determination whether in those parts with scanty tumor elements the mucosa appears uninvolved, or whether the lymphatic propagation or cancerous deposits are present.

The corpus carcinoma are in the great majority of cases primarily glandular, seldom without secondary solidity, and confine themselves, as a rule, to their point of origin. Only after a long interval do they attack the cervix. Nor is it established that the secondary involvement of the cervix is always through the deeper parts of the parenchyma. It is most reasonable to assume that in the solid as well as in the glandular cases the growth is in a downward direction along the mucosa.

The cervix cancers which are almost always primarily solid—only seldom primarily glandular—develop not only through the parenchyma (nearly one-half of the cases) but also along the mucosa, and occasionally by a superficial deposit toward the corpus.

There are apparent central cervix nodules; these, however, may be demonstrated to be in connection with the surface by means of preformed channels. The occurrence of this form is however, infrequent.

Among the cervix carcinomata, the glandular tend to spread toward the vagina more commonly than the solid variety; the contrary obtains as far as the parametrium is concerned. The vagina becomes, according to the present-day teachings, secondarily affected more frequently in portio disease; the corpus oftener in cervix carcinoma. Contrary to this view, we were not able to show a greater secondary involvement of the parametrium and lymph nodes in cases of cervix cancer as compared with the portio—rather the contrary rule obtained.

Five cases of primary cancer of the vagina, and one undoubted case of endothelioma, are also described.

Propaganda dating from Hegar's time, to educate the public concerning carcinoma, have done very little, especially in small towns, to bring patients to timely operation. This will perhaps continue to be so, on account of the very nature of the growth. Early symptoms, which should manifest themselves before necrosis takes place, are not yet known.

Endophytic carcinoma can stay a long time without giving symptoms. Cases have been observed that have reached the inoperable stage, manifesting very few symptoms. On the

other hand, in some cases relatively small cancers can become extraordinarily malignant and tend to recur within a short time. The amount of parametrial involvement is a gauge to the operability. When the outermost limits of the parametrium are invaded, the mortality becomes markedly higher. In doubtful cases laparotomy can decide the operability. It should be remembered, however, that this procedure is not without risk. (Wertheim lost seven out of seventy-three explorations.)

In the closing remarks of the book the authors declare that there must still be many workers in this field. "At the present time we must say with Rosthorn (1906): 'We do not desire to underestimate the value of the abdominal operation, nor do we at the same time wish to overestimate it, as we are still at the beginning of its development. That it is the only way which allows of an elucidation of cancer and all the theoretical demands made upon it, is certainly true'."

As a model of histologic research the present volume has no peer. It is to be hoped that other workers will continue this really great labor of love for the science of carcinoma. The volume by Schottlaender and Kermauner cannot fail to be of enormous value to workers from the experimental side and while the quest for the real cause of cancer is going on, it must lend a fresh impetus to increased endeavors especially toward an early clinical and pathological diagnosis.

J. C. RUBIN.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Statistics of Cesarean Section.—A. Richter (*Monatsschrift für Geburtshülfe und Gynäkologie*, March, 1912) reports his personal experiences with a series of 107 cases without any mortality on the part of the mothers and only one fetal death. The cases are presented with particular reference to the puerperal morbidity. Regarding the relation of preliminary vaginal examinations, it was found that the morbidity increased with the frequency of the same. It was also found that the least morbidity attended those cases in which the membranes had not ruptured. The length of the labor did not seem to have any direct influence on the appearance of fever during the puerperium, if other contributing causes could be eliminated. If the placenta was situated on the anterior wall of the uterus, the morbidity was markedly increased and the writer believes that the incision over the placenta should be avoided. Richter also thinks it is advisable to have the patient come to the hospital at least two weeks before expected labor in order to avoid contamination from without and to observe the labor in its early stages, so that the operation may be done before the membranes have ruptured

and as soon as the cervix has become slightly dilated. In this series of cases the technic included a long median abdominal incision with complete delivery of the uterus and the application of a constricting rubber tube around the lower segment until the child was delivered. The incision in the uterus was closed with two series of silk sutures, after which the hemostatic band was removed and the uterus returned to the abdominal cavity. The abdominal incision was closed in three layers. In 33 per cent. of the writer's cases, sterilization was done by resecting the tubes.

Cocaine Sensitiveness and Its Relation to the Adrenal Secretion.

—O. Wry (*Zeitschrift für Geburtshülfe und Gynäkologie*, vol. lxi, No. 3) has conducted an investigation on thirty pregnant women, in eighteen of whom a well marked increase in the sensitiveness to cocaine instillations into the eye were noted during the labor. In the greater number the increased sensitiveness continued for some time but it was further observed that the sensitiveness was most marked during labor and diminished more or less rapidly during the puerperium. Comparisons were made with normal women by studying the mydriatic reaction, which is supposed to depend on a stimulation of the sympathetic nerve supplying the dilator muscle of the pupil. The author concludes that this increased sensitiveness to cocaine depends on a heightened demand on the sympathetic nerve, which may be assumed to be the result of an increased amount of adrenin or some similar body in the circulation.

Unusual Bacillus in Puerperal Infection.—C. Koch (*Zeitschrift für Geburtshülfe und Gynäkologie*, vol. lxi, No. 3) describes two cases of puerperal infection in which a bacteriological examination showed the presence of a small labile bacillus which was negative to Gram's stain, hemophilic in its action and of a facultative anaerobic character. This bacillus showed a weakened degree of hemolysis on culture plates and was not pathogenic for animals. It presented a well marked resemblance to the influenza bacillus of Pfeiffer, and the only difference seemed to be its relation to oxygen, as the bacillus influenza has a well defined aerobic character. In each of these cases, the blood examination was negative, which seems to demonstrate that the penetrating power of the organism was a very slight one.

Response of the Uterine Musculature to Electric Stimuli.—

Rubsamen and Danziger (*Zeitschrift für Geburtshülfe und Gynäkologie*, vol. lxi, No. 3) as the result of a careful investigation find that the uterine muscle, both in guinea-pigs and the human subject respond to a galvanic single stimulus with a contraction, which comes on after the expiration of a definite latent period and lasts for several seconds. During this contraction the uterine muscle is insensitive to any other stimuli, and it is only after the maximum period of contraction has been attained that galvanic stimuli on the uterine muscle cause a contraction. It was also found that the shortening of the uterine muscle following

galvanic stimulation varied from 5 to 20 per cent. of the ordinary length, compared with 90 per cent. after stimulation by supra-
renin or ergot, from which it is probable that in the contractions following galvanic applications we are not dealing with a tetanic phenomenon but merely a simple contraction.

Pituitrin in Obstetrics.—O. Fischer (*Zentralblatt für Gynäkologie*, January 6, 1912) reports his observations on the use of pituitrin in a series of fifty cases, as the result of which he presents the following conclusions. Pituitrin may be regarded as a fairly constant oxytoxic in primary and secondary uterine inertia, the efficiency of which seems to depend upon the stage to which labor has advanced at the time of its administration. The author has not found it effective as a means of inducing labor prematurely or at the end of term, but it has given good service in active abortion and also in premature labor. Furthermore it is a valuable means of hastening the course of a normal labor in cases where the interests of the mother or the child demand the same. These include narrow pelves, rise of temperature during labor, danger of infection after intrauterine manipulations and certain cases of placenta previa. The drug seems to have a very satisfactory prophylactic action after labor where severe postpartum hemorrhage is expected, and in these cases, if the injection is given before the completion of labor the irritability of the uterine muscle is increased to such an extent, that if hemorrhage occurs it is more readily controlled by the usual procedures. No disagreeable sequelæ after the use of the drug have been noted in either the mother or the child, and the writer considers in agreement with many others, that pituitrin constitutes a valuable addition to the obstetrical formulary.

Size of the Uterus in Cases of Hydatidiform Mole.—H. Briggs (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 1) thinks it unlikely that a series of twenty-three cases in which the features and associations of hydatid mole are otherwise extensively embodied and confirmed, will prove to have been exceptional in the prevalence of the one physical feature of undersize of the uterus. Undersize of the uterus in sixteen cases with frequent quiescence and occasional recedence of the mole in the series of twenty-three widens the differential diagnosis in cases of missed abortion and intrauterine death of the fetus and modifies the current and contrary statements. In oversize of the uterus the part played by concealed intrauterine hemorrhage is apparently higher in frequency and greater in effect than has been generally stated.

Moderately Contracted Pelvis and Indication of Labor.—E. McDonald (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 73) says that induction of labor is suitable treatment in contracted pelves of moderate degree provided the size of the baby be estimated by measurements of the uterine fundus and fetal head and by the relation of the fetal head to the pelvis. Labor may

then be induced at the most suitable moment so as to get the largest sized baby that will pass the pelvic strait and avoid unnecessary prematurity. It is essential that cases be examined at least four weeks before the expected labor in order to estimate the proper time for induction. The lowest limit of pelvis contraction, suitable for treatment by induction of labor, is 8 cm. true conjugate, as this will allow the birth of a 2500 gram ($5\frac{3}{4}$ pound) baby with an average 8 cm. biparietal diameter. This weight of baby avoids the dangers of unnecessary prematurity and has a mortality but little more than the average. Better results are obtained with pelvises larger than this, but this is the lowest limit. Cesarean section has a mortality in 3000 cases of 7 per cent. and should be reserved for cases with pelvic contraction through which it is not advisable to have a baby pass (below 8 cm.), or to cases in which the child has already grown too large to pass through the moderately contracted pelvis. In these cases it may be done as a primary operation and the mortality reduced.

Treatment of Puerperal Septicemia by Bacterial Vaccines.—A series of 100 cases, fifty-six of which were treated with vaccines, furnish the basis of G. T. Western's (*Lancet*, Feb. 10, 1912) conclusions, which are that: The mortality among those cases of puerperal septicemia in which there is definite bacteriological evidence of bacteria in the blood stream is from 85 to 95 per cent. This mortality may by inoculation with autogenous vaccines be reduced to about 55 per cent. The mortality among officially reported cases of puerperal fever is about 60 per cent. This mortality may by inoculation with appropriate vaccines be reduced to about 30 per cent. In cases of puerperal sepsis, if it is decided to explore the uterine cavity the opportunity should not be lost of obtaining a culture at the same time. In the treatment of puerperal sepsis, "stock" vaccines give inferior results and should only be used when an autogenous vaccine cannot be obtained.

Function of the Langhans' Layer.—Romolo Costa (*Ann. di Ostet. e g. in.*, Feb., 1912) defines the Langhans' layer as the cellular layer in the placental villi between the connective tissue and the syncytium. The author has examined the villi in a series of abortions in which no cause could be determined. The series consisted of eighteen cases, interrupted in the second to the fourth month of pregnancy. Alterations were found in the layer of Langhans which had much to do with the causation of the abortion. There was an irregular penetration, distribution, or development of the connective tissue of the allantois in the villi, which allowed the introduction of the syncytium into the center of the villi. The observations of the author and his study of the layer of Langhans in various periods of pregnancy causes him to ascribe to that layer a function, sufficiently important, which is to prevent the lytic action of the syncytium on the connective tissue of the villi and to direct it instead toward the tissue materials.

Acute Edema of the Cervix in Pregnancy.—Normal edema of the cervix in pregnancy comes on during the first six weeks and remains without further enlargement during pregnancy. An abnormal case of acute edema is recorded by C. E. Paddock (*Surg., Gyn., Obst.*, 1912, xiv, 40). A healthy woman of thirty-five years had had four normal pregnancies and confinements. At the end of the fifth month of the fifth pregnancy, the patient's attention was called to a mass, the size of her fist, protruding from the vulva. Examination showed this mass, elastic, and of dark red color, connected with the uterus. Previous to this there had been for a few hours a discharge of clear fluid, later a serosanguineous fluid, then of blood. The patient was put to bed, hips elevated, and in twelve hours the tumor had disappeared from view, and hemorrhage stopped. Several times later in the pregnancy the same condition recurred, with the same clinical phenomena. The anterior lip of the cervix was the part most involved. Labor was normal, and the cervix involuted perfectly. After an intermission of two years, with regular menstruation, pregnancy again occurred. There was a repetition of the edema, as in the former pregnancy, with the exception that labor occurred during one of the attacks. Because of the hemorrhage, it became necessary to hasten the delivery, which was quite easily done. The tumor rapidly disappeared and the cervix has remained normal.

Acute Dilatation of the Stomach in the Recently Delivered Woman.—Audebert (*Ann. de gyn. et d' obst.*, Feb., 1912) publishes further cases of acute dilatation of the stomach after labor, in addition to those previously reported by him. There have been so far recorded eight cases. The author believes that these cases are not so rare as would seem from this, but are simply not recognized. They are characterized by several abdominal pain, vomiting, abdominal distension, and pain on pressure, which persists. A sketch of all the reported cases is given. The characteristic of these cases are persistent and profuse vomiting and failure of general condition. Immediate action is necessary to save life. The best remedy for this condition is to place the patient on the abdomen, face downward. This position at once brings relief. One pillow is to be placed under the abdomen and another under the head. Hypodermatic stimulation and intravenous injections must be used and lavage of the stomach is of some assistance. This condition occurs after long, severe labors and the use of chloroform. It also occurs after abdominal operations, version, forceps, extraction by the breech, etc. Gastric troubles may predispose to its occurrence.

Syphilis and Pregnancy.—Luigi Mangiagalli (*Riforma medica*, Feb. 10 and 17, 1912) considers the diagnosis of syphilis from the presence of a macerated fetus and the treatment of the mother and child for syphilitic conditions. Maceration is simply a cadaveric condition resulting from the presence of the dead fetus in the amniotic fluid; at a certain temperature without

air. The skin softens, becomes red, and the body flaccid. The length of time that the fetus has been dead may be told by the condition of the eyes. The cornea is colored at the eighth day; the crystalline lens at the tenth to eleventh day. In the majority of such cases syphilis was the cause of death, but not always. The examination for spirochetes in the tissues will often determine this; also microscopical examination of the tissues of the fetus will furnish evidence of syphilis. The syphilitic placenta has specific characteristics; it is very large and heavy; it is edematous, and yellowish-gray; there are present deforming hypertrophy of the villi and sclerosis of the connective tissue. The cord shows similar alterations. As to the method of infection of the fetus, whether by mother or father, there are four possibilities. The ovule and spermatozoon may be infected and thus give absolutely hereditary syphilis. Or the germ may be transmitted through the placenta, a congenital syphilis by placental transmission. The spirochetes may be found on both sides of the placenta and in the cord. They have been demonstrated in the testicle and spermatic canal but not in the spermatozoon. There is also a hereditary dystrophy caused by transmission of the poison without the germs. When the father is healthy and mother syphilitic the infection may pass from the mother by an infected ovule or through the placenta. When the parents are both healthy at time of conception, and become infected during pregnancy the fetus will generally be syphilitic. It may be apparently healthy but shows manifestations of syphilis later. If it nurses its mother it will not be infected, because of a sort of immunity caused by the toxins which have penetrated the placenta; but the Wassermann reaction will often be positive in the fetus. The child may be born healthy, because of the length of time of incubation after infection before the secondary symptoms show themselves. If the infection takes place in the sixth or seventh month the fetus may remain normal. If the father is syphilitic and the mother healthy, or the mother appears to be healthy and is not infected in coitus, the fetus is born syphilitic, or with latent syphilis. If nursed by the mother she is not infected, but if nursed by a wet-nurse the latter will be infected. The transmissibility of the disease lessens with time. A woman may continue to abort or have premature fetuses for many years after infection. In the father the time of contagion is gradually lessened; in the mother it remains the same. This may be explained thus: the ovules may all be infected and remain infectious permanently, while the infected spermatozoa are gradually eliminated. Tertiary lesions are generally regarded as noncontagious. In a woman the contagiousness of syphilis is not attenuated by time. The husband may be in perfect health and yet the wife continue to abort. The question of treatment is difficult, that treatment will act on the fetus through the placenta has been demonstrated. If the mother is treated a mortality of

75 per cent. in the fetus is reduced to 25 per cent.; a percentage of abortion is reduced from 30 to 13 per cent. If treatment is given early the effects are much better. Small doses may be given to the mother and will be effective on the fetus and she will not be harmed by them. The mother should always nurse the child, artificial feeding should never be tried even when the mother appears healthy, since she is not in danger of infection. The best treatment for the child is mercurial frictions. Treatment through the mother's milk is too slow in its results. Arsenobenzol should be used only when mercury has not had a good effect.

Arnoux' Sign in Twin Pregnancy.—M. Le Lorier (*Jour. de méd. de Paris*, March 30, 1912) says that in the diagnosis of twin pregnancy the stethoscopic signs are the most important. Two distinct sounds of two hearts may be heard at different points of the abdomen. The hearing by different observers of two nonsynchronous hearts with beats of different frequency is a certain sign, but we can rarely obtain it on account of the absence of the second observer. The author mentions a new sign of value; it consists in the perception by the same observer at the same point of two hearts, not always synchronous, so that the sound is at intervals like that of two horses trotting together, the feet being alternately synchronous and nonsynchronous, giving gallop rhythm. Production of this sign requires proximity of the two hearts, or the overlapping of their zones of propagation. We must explore systematically with a stethoscope all the accessible surface of the uterus, especially the zone between the two points of heart sounds. This sign may be found in one out of every three cases of twin pregnancy.

Remote Results of Classic Section.—M. Marioton's (*Arch. mens. d' obst. et de gyn.*, March, 1912) statistics are those of twenty-four cases on which Bar performed a second, third, or fourth Cesarean section. Of these, sixteen had the operation performed for the second time, six for the third time, and one for the fourth. He considers the risk of rupture and the difficulties of the repeated operation. There was no rupture of the uterus in any of these cases in the repeated operation. In the woman who had been operated on four times the scar was quite thin. The difficulties are eventration, which did not occur in any case, and adhesions, which were not severe in any case. The author finds that repeated Cesarean operations are not much more difficult than the first operation. The results obtained in this series of cases justifies repetition of the classical Cesarean section. In the absence of any special complication which would make the prognosis bad, sterilization should not be resorted to. These operations should be practised under the best conditions possible. The greatest care should be exercised in the choice of patient and of the technic to be used in the operation.

GYNECOLOGY AND ABDOMINAL SURGERY.

Roentgen Ray Treatment in Gynecology.—Eymer and Menge, (*Monatsschrift für Geburtshülfe und Gynäkologie*, March, 1912) present the results of their observations with this therapeutic measure in a series of 164 cases treated in the gynecological clinic of the University of Heidelberg. The series included ninety-five cases of myoma, fifty-eight cases of uterine hemorrhage due to other causes, five cases of peritoneal tuberculosis and a number of isolated cases of various kinds. The writers believe that in women over forty years of age a permanent amenorrhea, and in younger women an oligomenorrhea may be established, but this will only result from a continued period of treatment and unless due to myoma is not always to be sought for. It appears that in general, with increasing age, a lessening dosage of the rays is required, whether the hemorrhage is or is not accompanied by myomata. It was found that a well-marked improvement in the red cell and the hemoglobin content of the blood occurred, and in a few cases, a distinctly favorable effect on the cardiac action could be demonstrated. In addition to this, the subjective symptoms disappeared and the general condition was almost always favorably affected. An important fact noted in connection with the treatment of myomata is that in most cases the size of the tumor undergoes marked diminution, which may often be demonstrated even before the hemorrhages actually cease. In the majority of the cases under observation, more or less marked symptom complexes were noted which resembled those following operative castration and their importance cannot be underestimated. Irritable conditions of the bladder and intestines occasionally appeared but seemed to be transitory in their effects. It is probable that the rays in the case of fibroid tumors do not manifest their effects on the ovaries alone, but influence the growth of the tumor itself. Notwithstanding the cost and the prolonged time of treatment, the writers believe that there are many patients who would be willing to submit to this, rather than a more radical procedure. In order to more definitely establish the indications for such treatment of fibroids, these were divided according to their clinical import into three groups. The first included those in which there were few or no symptoms and which did not grow rapidly. The second group included all those cases in which the symptoms though well marked, were still bearable and which, even after prolonged periods, did not produce marked changes in the general health. The third group included all rapidly growing myomata which have an effect on the general health, particularly as regards the progressive anemia and disturbances in the circulatory and urinary organs. All the cases in the second group may be considered suitable for treatment by the method noted but the choice depends on the time of life and the size of the tumor, especially if these are found in older women. In the third class of cases, the purely symptomatic treatment is

ruled out and it is advised that all cases that have passed the fortieth year Roentgen ray treatment be instituted.

The Lower Uterine Segment.—A. Grazel (*Zeitschrift für Geburtshilfe und Gynäkologie*, vol. lxi, No. 3) was led to make an anatomical study of this subject, prompted by the uncertainty which still seems to exist regarding the presence of a thinned out lower segment of the uterus in late pregnancy. The research was based on an examination of eleven nonpregnant and four pregnant uteri and also one puerperal uterus. In preparing the sections for microscopical study, the mucicarmine stain was employed, following that with hematoxylin. By this method it was found that the internal os could be readily demonstrated and localized. Grazel claims that there is no anatomical uterine segment demonstrable between the body of the uterus and the cervix, and that this organ can only be divided into two parts, cervix and corpus. An examination of the pregnant uteri leads the author to confirm the views of Bandel and Kustner according to which the cervix from the middle of pregnancy on becomes dilated and is taken up into the uterine cavity. The lower uterine segment therefore corresponds to the upper part of the cervix. According to this view the so-called contraction ring is merely the internal os and the area below this, which includes the dilated cervix, is the ring of Müller.

Operative Statistics of Uterine Cancer.—W. Busse (*Monatschrift für Geburtshilfe und Gynäkologie*, January, 1912) presents the statistics of the cases operated upon in the Gynecological Clinic at Jena during a period of eighteen months from 1903 to 1904. Only those cases are noted which were operated upon by the abdominal route. This list includes three cases of carcinoma of the body of the uterus, operated upon by the Wertheim method, all of which recovered from the operation and who were alive and free from recurrences seven years later. One patient died two years after the operation from some cardiac complication, and was already sixty-four years of age at the time that the operation was done. Of the cases with carcinoma of the cervix, there were fifty-nine operated upon out of a total of seventy-nine in which the diagnosis was made but no operation done for various reasons. The primary mortality in this number of cases was about 25 per cent., a total of fifteen cases, of which twelve died as the result of infection, one from bronchopneumonia and one each from cardiac weakness and inanition. Five years later, nineteen women were still alive out of forty-four which recovered from the operation. Of this number, nineteen or about 43 per cent. had remained free from recurrences. Of those who developed recurrences, twenty-four occurred within the first three years after operation. In twenty-three of the recurrences, the growth was localized either in the vagina or the parametrium. In one case the recurrent growth appeared in the stomach and nothing was noted in the genitals.

Richter's Hernia.—Richter's hernia may be defined as an

abdominal hernia in which a portion of the circumference of the gut is imprisoned, reducing, but not entirely obliterating, the lumen of the intestine. It is more common in women than men, more prevalent in the fifth decade, and the majority are of the femoral variety. C. S. White (*Surg., Gyn., Obst.*, 1912, xiv, 46) records the histories of two cases. He says that the symptoms have little uniformity and are unreliable and misleading. In one-third of the cases, the symptoms are typical of strangulated hernia and all cases have some symptoms suggestive of this condition. With a palpable tumor in a hernia area, obstruction and little distension, we can entertain a diagnosis of Richter's hernia. Treatment is strictly operative.

Method of Shortening the Round Ligaments in Retroversion and Prolapse of the Uterus.—C. W. Strobell (*Internat. Jour. Surg.*, Jan., 1912) makes two vertical incisions each one inch in length, parallel with and slightly external to the pubic spines and including only skin and fat. Through a median abdominal incision an index finger is inserted to act as guard and guide, and a curved blunt perforating forceps is forced through the intervening tissues between the lower end of the pubic incision and this finger. The forceps grasps and draws out the round ligament until all slack is taken up and the loop of ligament is sutured to the fascia and Poupart's ligament. The other round ligament is treated similarly and the cutaneous incision is closed. Before closing the abdominal incision, inspection shows the fundus uteri about an inch and a half below the level of the pubic crest; that it is fully an inch and a quarter away from it, freely movable backward and forward; and that there is plenty of room to accommodate the varying caliber of the restored urinary bladder. It will also be seen that when the patient shall have assumed the sitting or standing posture the uterus will fall forward, and rest upon the upturned posterior surface of the pubic process, and that the ligaments will then be wholly relaxed, as in normal anteversion, to which latter position, as a result of this technic, it must closely conform. The difficulty in drawing the round ligaments out through the narrow canal formed by the perforating forceps emphasizes the security against postoperative hernia.

Ossification of the Ovaries and Tubes.—S. Pozzi and Xavier Bender (*Rev. de gyn.*, Feb., 1912) state that ossification of the tubes and ovaries is extremely rare. He reports three cases observed by him, one involving the tube, the other two the ovary, and sums up the cases reported by other medical writers. In one ovary the ossification developed in a corpus luteum; in the other it occurred in the stroma of the ovary, in the medullary zone. The evolution of the process of ossification remains the same whether it takes place in the wall of the tube, the stroma of the ovary, or the corpus luteum. Ossification does not arise from a dermoid cyst, or a solid embryo, as has been supposed by some authors. They are true direct ossifications of the ovary. The osteogenesis is very circumscribed and is a retro-

gressive modification of the pre-existing tissue elements. There is first a calcification of the tissues, and in this a certain amount of true ossification takes place. Histologically the structure is that of true bone, with typical osteoblasts, bone spicules, and bone marrow. The bone structure is not so regular as in the normal situations. There are no Haversian systems, and the osteoblasts are not so numerous as usual. The structure resembles spongy bone such as occurs in the callus after a fracture. Ossification does not begin from cartilage, since none is present in either tube or ovary. The osseous tissue is formed directly from connective tissue. By proliferation granulation tissue is produced which organizes under the myeloid type, and the osteoblasts form bone as usual.

Lipectomy for Adiposity and Menstrual Irregularities.—G. A. Casalis (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 34) records the excision of a wedge of abdominal fat as described by Kelly in two young women who suffered from extreme abdominal adiposity and amenorrhea. Regular menstruation followed. He thinks that lipectomy is indicated in young women whenever an excessive deposit of fat on the abdomen interferes with the menstrual function and leads to amenorrhea, especially when the later condition is not amenable to other therapeutic agents. Lipectomy from a purely esthetic point of view is a highly satisfactory operation. It is devoid of danger, and would appear in some well-defined cases to increase tissue metabolism and restore ovarian activity.

Vater-Pacini Corpuscles in the Fallopian Tube.—Pol Coryllos (*Rev. de gyn.*, March, 1912) has made a study of two cases of tubal disease in which corpuscles of Vater-Pacini were found in the lining of the tube. The painful sensations were not increased by the presence of these corpuscles as might have been expected. This anomaly is exceptional. These corpuscles belong primarily to the subendothelial tissue of the canal of Müller; they become accidentally transferred to the wall of the Fallopian tubes. They have no physiological function in the tube when found there. They may present pathological alterations when present in the tubes.

Radium Therapy of Membranous Dysmenorrhea.—Ch. Jacobs (*Rev. mens. de gyn., d'obst. et de ped.*, March, 1912) considers the use of radium of great value in dysmenorrhea of the membranous type. He has employed it successfully in three cases. After dilatation with a laminaria tent, a small tube containing 1.50 centigrams of radium is placed in the uterine canal. This is left in place for an hour, and the treatment is repeated once a week for three weeks. The dysmenorrhea is relieved even at the period following the first treatment, and remains much less severe.

Hemolysis in Pregnancy and Cancerous Conditions.—Graff and Zubruzycki (*Münch. med. Woch.*, March 12, 1912) present the result of their studies on the action of cobra poison on hemolysis

of pregnancy and in the presence of carcinoma. In an extended series of cases they found that the blood serum from carcinomatous patients activated the hemolysis of cobra poison in horses' blood in over 70 per cent. of the cases. The serum of normal individuals as distinct from that of patients suffering from other diseases produced this result in about 10 per cent. of the cases. They believe that the reaction is of no diagnostic value for carcinoma, because women operated upon years previously continue to manifest a strong activity. The diagnosis of pregnancy is possible with certainty only from the beginning of the fourth month and in the puerperium; the reaction is positive for three weeks postpartum.

ITEM.

ARMY MEDICAL CORPS EXAMINATIONS.

The Surgeon General of the Army announces that preliminary examinations for the appointment of first lieutenants in the Army Medical Corps will be held on July 15, 1912, and September 3, 1912, at points to be hereafter designated.

Full information concerning these examinations can be procured upon application to the "Surgeon General, U. S. Army, Washington, D. C." The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between twenty-two and thirty years of age, a graduate of a medical school legally authorized to confer the degree of doctor of medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training, after graduation. The examinations will be held concurrently throughout the country at points where boards can be convened. Due consideration will be given to localities from which applications are received, in order to lessen the traveling expenses of applicants as much as possible.

The examination in subjects of general education (mathematics, geography, history, general literature, and Latin) may be omitted in the case of applicants holding diplomas from reputable literary or scientific colleges, normal schools or high schools, or graduates of medical schools which require an entrance examination satisfactory to the faculty of the Army Medical School.

In order to perfect all necessary arrangements for the examination, applications must be complete and in possession of the Adjutant General at least three weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There are at present sixty-eight vacancies in the Medical Corps of the Army.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

THE VALUE OF THE MUNICIPAL CONTROL OF CHILD HYGIENE.*

BY

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HOFFMAN has stated in his work on the "Sphere of the State" that "that is not the best government which governs the least but, on the contrary, that which enters most deeply into the real needs and daily interests of its subjects," and, further, "the ultimate responsibility for the child is with the State, and it should spare no means to make the child as useful a member of the State as the capabilities of the child and the given circumstances permit."

Over 100 years ago, the State, through its power of government, recognized this responsibility by deciding that a citizen, to be useful, must be literate, and for this purpose established its system of free public education. To-day the State is recognizing that a citizen, to be useful, must be healthy, and in acting upon this principle has ultimately come to the realization that preventive health work among children offers a vast field of potential possibilities, not only in the prolongation of life, with a decreased death rate, but in the greater efficiency of those who live, with correspondingly decreased poverty, delinquency and dependency. Modern sanitary science seeks to counteract those conditions which further the development of the so-called preventable diseases. As life, measured by the years of its normal duration, approaches and passes its meridian, the preventable diseases decrease in the frequency of their occurrence. Approximately one-fifth of all deaths at all ages occur during the first five years of life. At least one-half of these are preventable. The deaths from infectious diseases are mainly encountered between five and fifteen years of age, while tuberculosis, which causes more deaths than any other single disease, is mainly dependent upon a lack of natural or acquired resistance, and it is probable that this latent tendency has its inception during the period of childhood. The effort to eliminate tuberculosis will be

*Read before the Section on Public Health of the Medical Society of New York State, Albany, N. Y., April 18, 1912.

successful only in proportion to the recognition of this knowledge, for public health work among children offers a solution of the tuberculosis problem in the only way it will ever be solved, and that is by primarily preventive measures.

The vast alien population of our cities, the congestion of population, economic strain and lack of adjustment in living conditions, are matters which must cause us the greatest concern, for, whatever may be the effect upon the adult, it is certain that it in no way approaches the serious results that are found in the case of infants and children born, and doomed to live, among surroundings which afford them little or no opportunity for a normal, sane or healthy life.

Cities in themselves are causing the very conditions which sanitarians and social workers are now using their efforts to correct. If cities produce the factors that mean excessive infant mortality and high disease incidence among children, the cities must pay the cost of their own neglect, and as a measure of self preservation bend their energies toward the elimination of those features which have caused this serious and wholly deplorable condition of affairs. The cost measured in dollars and cents alone, may seem great to the unobservant and those unfamiliar with the existing status, but from the point of view of the preservation of the State in assuring good health to the next generation, it is infinitesimal and unworthy of consideration. The children of our vast alien population are our real American citizens in the making. Keen, intelligent, actively interested in all features of their new life, they furnish a never ending source of inspiration to those of us who know them, and work through and among them. Not only are they the vulnerable points of attack in educational public health work, but they are physically the material itself upon which the force of public health work must be expended. Their future value to themselves and to the nation depends upon their knowledge of those laws which make for physical and mental well-being. Thus, while health work among adults must be largely restrictive and corrective and often disappointing in its results, public health work among and for children can be made preventive in its highest meaning, and the results are well worthy of all the time, money and energy expended in producing them.

In line with these principles, the Department of Health of New York City, organized its Division of Child Hygiene in August, 1908. Since that time at least one other large city has

followed its example, while in each one of the other large cities the question is being actively discussed and all possible efforts are being made to obtain the necessary funds to allow such an organization.

A question which has never been decided, and which probably never will be, is the actual money value of a human life. Court decisions, which might be taken as a standard, show a fluctuation so wide that no standard can be deduced. The basis has usually been placed upon the earning capacity and as infants' and children's earning capacity is rated as nil, the money value of their life or an estimate of their future productive capacity based upon good health is exceedingly difficult to determine. It has, however, been stated many times without dispute that the money value of the life of an infant under one year of age is \$100. With this as a basis, it may be seen that 15,000 infant deaths in New York City last year alone meant a money loss of \$1,500,000.

In its efforts to reduce infant mortality, the Department of Health of New York City made a strenuous and energetic campaign during 1911. While it is not possible to estimate the exact number of lives saved which may be charged with any degree of accuracy to the credit of any particular organization working in this field, yet from the point of view of the city and its expenditures, it may readily be demonstrated that the actual cost of saving the baby's life is considerably lower than the loss involved in allowing it to die. Some few years ago, the New York Milk Committee, after a series of investigations, stated that the average cost of medical attendance and funeral services for each baby that died in New York City was fifty dollars. During 1911 the death rate in the Infant's Milk Stations conducted by the Department of Health was 2.4 per cent.; in the district work of the department under the charge of the visiting nurses, the death rate was 1.4 per cent. The cost of this service amounted to about two dollars a month for the milk station baby and about sixty cents a month for the baby who was cared for in its own home. The total reduction in infant mortality for the year in actual numbers was 1183, or a financial saving of \$118,300. Even though such a method of reasoning may be used to prove the point I wish to make, yet it would seem unworthy of consideration when compared with the humanitarian side of this life-saving project. The saving in human anguish alone cannot be computed, and the conservation of life means more to the

State than the conservation of any of its more material resources can ever mean.

The exact financial value of the medical inspection and examination of children who are attending our public schools is impossible to estimate. It has never been possible to determine with mathematical accuracy the exact number of nonpromotions due to physical defects or the influence on promotion of the medical correction of these defects. Many other factors must be considered, as the mental equipment of the child, the character of its instruction, the idiosyncrasies of teachers and the variability of the methods governing promotions, but that the physical condition of the child bears a very direct relation to its progress in school is an accepted deduction that may safely be made as a result of the knowledge we already have upon this subject. In fact, this statement is almost superfluous, as it is a matter of common reasoning that a sick child is necessarily not in a condition either to attend school regularly or to profit by the instruction that is given it.

In New York City since 1908, 727,750 children in the public schools have received a complete physical examination. Of this number an average of 40 per cent. were found to have one or more associated physical defects such as defective vision, adenoid growths, enlarged tonsils, defective nutrition, pulmonary or cardiac disease, orthopedic defects and tubercular glands, with or without the most common defect that we find, namely, defective teeth. Thirty-five per cent. of the remainder of the children examined were found to have defective teeth as the only physical defect. Such a condition certainly merits consideration as it is quite evident that these defects have been hitherto unrecognized and untreated and that it is the duty of the city, in order to protect itself, to use all reasonable means to see that the children are given an opportunity to be placed in normal physical conditions. In the schools alone the efforts of the Division of Child Hygiene have resulted in an immense gain in school time for those children who were affected with contagious eye and skin diseases, the necessary exclusions from school attendance for these reasons being reduced from over 57,000 in 1903 to slightly over 3000 in 1911.

Of the children who were found to have physical defects other than the single defect of teeth, approximately 80 per cent. have been placed under medical care. Our experience in New York also coincides with that of all other communities

where a similar system of supervision of the health of school children has been in operation. The general improvement in the health and cleanliness of the child, and the home hygienic conditions which have a distinct bearing upon the health of children, are manifest to anyone who compares the status of the city child to-day with that obtaining a few years ago.

One objection which has been raised by the medical profession in regard to this work should not pass unnoticed. It has been alleged that the assumption by the city of the responsibility for the health of school children has made serious inroads upon the practice and income of private physicians. In order to ascertain the exact conditions in relation to this matter, I have had tabulated for the year 1911 the various sources from which children have received treatment. During that year, of the 65,150 children, 37,986 or 58 per cent. were treated by private physicians or dentists, while the remainder 27,164 or 42 per cent. were under the care of hospitals and dispensaries. An absolute rule of the Department of Health is that no child shall be referred to an institution for treatment until it has been definitely ascertained by the medical inspector or nurse that the family is unable to pay for the services of a private physician. When it is remembered that the defects for which these children are treated are those for which no treatment has hitherto been received, and except for their discovery by the department would remain neglected, it may be readily seen that the department is turning over each year to the physicians of the city thousands of cases that would not have come to them under other circumstances.

During the three years that this work has been in operation, there has been a definite decrease in the percentage of the number of individual defects found each year, with the exception of defective teeth. The incidence of defective vision has decreased from 13 per cent. to 10 per cent.; defective normal breathing, which implies the presence of adenoid growths, has decreased from 18 per cent. in 1909 to 11 per cent. in 1911, while hypertrophied tonsils show a decrease from 22 per cent. to 15 per cent. in the same space of time.

This work in the schools, with its control of the contagious disease situation, with the elimination of the school as the main focus of infection; the physical examination of each child as soon as it enters school, before it is allowed to graduate and as nearly as possible every two years in the interim; the instruction of the parents in the character of defects found and in the

necessity for treatment and the follow-up work necessary to induce parents to provide treatment or to record their absolute refusal to do so, was performed during 1911 at a per capita cost of \$0.43. During this same year the per capita cost of the year's schooling in the public schools of New York City was \$43.90. From a comparison of these figures and facts, it would seem that one had a right to conclude that from either an economic or humanitarian point of view the city is justified in its expenditure by assuring to its future citizens that good health which means virile and useful man and womanhood. The State has a wider duty in this matter, however, than merely to consider the health of the child in its relation to its school progress. The broad and vital questions which concern the health of the next generation are demanding attention.

In child hygiene, as it is viewed by the New York City Department of Health, is implied the health surroundings and conditions of the child's entire life, not merely the child in relation to any one phase of its development, nor in relation to any one phase of its life in or outside of the home, but the child itself from birth to puberty in relation to all of the circumstances, conditions, and incidents which bear upon its life history and welfare. The health of the child to its fifth year has a most important bearing upon its health between the fifth and fourteenth years, which is the school age, while its health during that period is of equal importance in determining its future welfare. Even during its school life the greater part of its time is spent in the home or under influences which are not within the jurisdiction of the school authorities. Systematic and continuous oversight during the entire life cycle of the child are essential if we are to gain a well-rounded childhood.

In line with this policy the division includes in its activities the control of midwives who, in New York City, report about 40 per cent. of the total number of births. The supervision and licensing of these women under the authority of the city, since the organization of the Division of Child Hygiene, has resulted in a marked improvement in their methods and consequently in the health of the women and children under their charge. For six years the department has required that a 1 per cent. solution of silver nitrate be used by midwives as a prophylactic measure for the prevention of ophthalmia neonatorum. The midwives are required to report every case of sore eyes occurring in their practice, and ophthalmologists are sent in each instance to deter-

mine if true ophthalmia neonatorum is present. For many years the statement has been made by competent persons that one-quarter of all persons in the asylums for the blind were there as a result of blindness due to ophthalmia neonatorum. In order to ascertain the result of the activity of the department in this regard, a searching inquiry was made during the past year to determine the present status of these cases. Inquiry was made of every institution for the blind in New York City and throughout New York State as to the number of children under observation under five years of age born in New York City and blind from ophthalmia neonatorum. This age limit was taken as covering the time that the department's efforts might reasonably have shown results. Only six cases were reported under this heading from all of the institutions. The committee on the Prevention of Blindness of the New York Association for the Blind stated that their records under this heading showed but five or six children of five years or under blind from this disease, a total of twelve cases in the entire state. In this point alone, in decreased human suffering, increased efficiency and economic independence, the gain is so vast that it cannot be compared with the insignificant amount of money expended to produce such results.

The facts in regard to puerperal septicemia are also worthy of comment. Every death that occurs in New York City from this disease is investigated by the department. If a midwife has been in attendance at any time, even for a period of only a few minutes, the case is listed against her record and is classified as one in which a midwife was in attendance. Notwithstanding this attitude, which does not in any way give the midwife the benefit of the doubt, it has been found that while approximately 40 per cent. of the births were reported by midwives, only 24 per cent. of the deaths from puerperal septicemia can be charged to their account, while physicians reported approximately 60 per cent. of the births, and were in attendance at the time of confinement in the case of 76 per cent. of the women who died from puerperal septicemia.

I have taken a few isolated instances of the work of the division simply to give an idea of some of the directions in which a distinct value can be demonstrated. No attempt has been made, however, within the limits of this paper to cover the many features of the work which are daily resulting in improved health and physique to the children of the city. The work is an

expression of the new relation between boards of health and the public. It is not paternalistic but rather social, economic and humanitarian. It is a definite recognition of the value of educational forces as the predominant feature in modern sanitary methods. Its ultimate object is one that is so broadly humanitarian in its purpose, and so stands for all that is idealistic and valuable in our national life, that we may well agree with Croly, who gives expression to the spirit premeating this constructive and far-reaching effort to help children, when he says "The only fruitful promise of which the life of any individual or any nation can be possessed is a promise determined by an ideal."

33 WEST NINETY-SIXTH STREET.

THE SIGNIFICANCE TO THE PHYSICIAN OF PHYSIOLOGICAL AGE.*

BY

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THE doctrine of Physiological Age affirms the fact that mental and physical development of children, adolescents and adults, proceeds through easily recognizable and discrete stages, and maintains that all classification and grouping of the growing and developing human being should take cognizance of and relate themselves primarily to these stages and secondarily, and, in a decidedly minor way, to the artificial groupings upon the basis of the school grade or chronological age.

This doctrine is based upon a careful but as yet incomplete survey of developmental stages. The developmental signs may be *anatomical*, such as the appearance of the six-year molar, the wisdom tooth or pubic hair; physiological such as menstruation, change of voice, menopause, or *physiological* such as change in rote to associative memory, the wane of the collecting tendency, the budding of the earning instinct, and the characteristic rumination of senescence. We have sought to ascertain by extended and intensive investigation what the significant stages of change may be and to hit upon easily recognizable *signs* whereby we may from observation denominate a child or adult to be in this or that stage, so that we might place him in classes of

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individuals of similar stages of development for the purpose of adjusting and standardizing our medical, scholastic and social treatment to natural instead of artificial requirements.

The most recent and widely noticed attempt to establish a series of critical tests of development have been those of Binet and his many followers. Binet has sought to establish a scale of mental tests which will reveal psychological development. The natural consequence of his work has been a desire to classify children upon the basis of similarity of success in passing these tests, for the purpose of scholastic treatment. While his tests are based on chronological age, yet the purpose and result of his work will be a set of tests of psychological ages released from chronological age and from school progress which will do much to place treatment of children upon a sound developmental basis.

The particular place in the succession of developmental stages where it is most essential for us to recognize physiological age is at the time where the changes are most rapid and critical, and this is at the age of puberty. Puberty may occur at any time from nine to seventeen, and under exceptional circumstances as early as five or as late as thirty. When it does occur it brings with it changes that are of paramount importance. It presents all the aspects of a new birth.

Up to the time of puberty growth has been slow; with the beginning of the initial stage of pubescence it becomes rapid, in six months or a year 3 or 4 inches in height and 20 or 30 pounds of weight may be added and the strength may be doubled. The mental changes are striking—the type of memory changes from rote to associative, imagination leaves the realm of fancy and becomes intensive attached to affairs of life as it is, rather than as told in fairy tale. Interests change from childish to manly things, old landmarks are lost and a search is made for new, the earning instinct, the instinct for taking a place in the world of affairs arrives and becomes paramount. In short, the pubescent is wholly different in every way from the postpubescent; he is still a child while the postpubescent is a man; it is, therefore, reasonable to maintain that we should treat them differently. These facts have been presented to the public at various times, and the results in change of thought and practice have already become apparent.

The National Education Association in its July meeting, in 1911, adopted without dissent declarations containing the following: "That the laws should recognize the difference between

the chronological age of a child and his maturity, and that the school-age limit of each individual child, should be determined by requiring the child to meet physical and mental tests, even though the child be in years above the age standard; in other words, a child's actual age should be determined by physiopsychological data corresponding to the normal standard for the age limits required by law. All children or persons failing to meet such maturity tests at the extreme school-age limit should remain under public supervision and control, either until they reach nativity or permanently.

"The same principle should be the guide in determining whether a child is fit to be employed in any occupation. Not when a child is fourteen or sixteen years of age, but when he possesses the maturity of body and mind proper to a normal child of that age, should he be released from the guardianship of the state, of the community. Child-labor laws should be so modified as to meet this requirement."

The Section on Preventive Medicine of the American Medical Association revised the report of the Committee on Medical Inspection of School which broadly recognized the doctrine of physiological age. "Scope of the examinations: Physical and developmental examinations should be sufficiently extensive to ferret out and determine, as far as possible, the causes of arrested growth, physical and mental.

"1. The data of these examinations should serve as skilled information to parents and teachers in recommending and advising medical and dental aid essential for health and development.

"2. When taken in connection with the school curricula and sociologic factors of the pupils' environment, the data of these examinations should form the essential basis for the adjustment of educational activities, both physical and mental, to meet the requirements of physical and mental health, growth and development. Further, it recommends "that not only the content of education, but all the processes of education should be considered in relation to the health and growth of pupils and students. It challenges every subject of instruction any every principle and every method of education."

Its central problem is growth and development. To this end physical and developmental examinations ought to determine defective physical and mental conditions, developmental periods of growth and stages of development, physiologic age, and, as far as possible, mental age. Further it recommends "as

far as practicable, the grouping of pupils in accordance with development age."

Those working with backward and exceptional children have very generally adopted the principle of classification on the basis of various physiological and psychological epochs. Most prominent in the application of this method have been Goddard of Vineland and Groszmann of Plainfield. Many of the Young Men's Christian Associations of the country now record pubescence on their examination records, and regard it generally in the classification of their boys' departments. In many more they have divided the boys for the purpose of athletic competition on the basis of weight which is a fair approximation to an actual division upon physiological lines.

In the New York City High Schools this record has been made for six years, and in one high school there has been a division of classes upon this basis. In all schools athletic competition is based upon weight. In the management of boys in many summer camps the doctrine of physiological age has been applied with excellent results. Dr. George L. Meylen, of Columbia University, in his White Mountain Camp, on Lake Sebago, classifies his boys into two groups—the immature and the mature—on the basis of the pubescence sign, and these two groups again subdivided into two. He finds the boys have a "better time" grouped with mates with whom they would naturally associate under normal conditions. It is easier to select masters who are particularly able in handling one or the other groups, the more vigorous camp and field work can be given to the more mature group, and the immature get the kind of care which they particularly need, and which would be interpreted by the mature as restrictive measures. Sports, training and competition are readily made to fit each group, and the handling of the camp resolves itself into natural and distinct departments. He disregards chronological age entirely, placing some boys of fourteen in the most mature group and others of like age in the least mature group as their stages of development warrant.

In the high school of Commerce eight sections of the entering class were arranged in homogeneous developmental groups on the basis of pubescence, and the remaining four were not so divided. In the arranged eight sections the rate of discharge from school was 35 per cent. less than in the four unarranged sections and 33 per cent. less than from the previous entering class also unclassified. Dr. William E. Grady, offered to put into actual

practice this doctrine. Since it was impracticable to observe the pubescence sign of puberty, the writer visited the school and divided the boys of each grade from 6B upward on the basis of mere inspection. The boys formed a line and passed in review, each stating his age to the examiner. He was then given a number—one was most mature, five the least. The following signs were noted; the voice (changed and low or unchanged and high); the presence of the second molars; height and weight; the subcutaneous fat of the face and hands. In the immature, the subcutaneous fat is more evident and adheres closely to the skin which is of finer texture; in the mature the skin is firmer and thicker, less attached to subcutaneous tissues, which contains less fat. The prepubescent is chubby, the postpubescent may be fat, but there is an easily recognizable difference. This inspection is frankly different from the examination for pubescence, and the resulting classification may or may not differ from a division on the basis of that sign. It stands as a separate, but allied experiment, and its results regarded accordingly.

To one who has made full examination of tens of thousands of boys, such an inspection approximates pubescent ratings very closely. It is important to note that any close student of boys may be almost equally adept, for the principal of the school after witnessing the classification of three classes designated the gradings for twenty boys, eighteen of which were correct and two varied but one step. At the promotion immediately after this inspection, the boys were grouped into classes, of which there were three of each grade, so that one class contained the most mature, one-third of all who were in the grade. The remaining two-thirds less mature formed the other two classes without further separation.

Just before the presentation of this paper after the experiment had been in progress nearly two months, the writer interviewed the teachers of these classes to observe any results. It was surprising to find practically all of the teachers already had much to say upon the subject of the advantage of this grouping, and that they were of that type of intellectual independence that led them to give many observations regardless of their agreement with any preconceived thesis.

Advantages of the Homogeneous Group.—I present the opinions as follows: Social consciousness is solidified; a feeling of solidarity in older groups becomes apparent, whereas in the mixed group the older boys found themselves separate and often isolated

individuals. The tone and consciousness of the class was one in which the most successful scholars, who were mainly the immature, become predominant and the older boys were out of the social current. The separation of the mature group from the immature, gave a class in which each exhibited to all the similar aspects of maturity, and allowed them to feel the presence of neighbors of their own kind with similar social and scholastic tendencies, abilities and disabilities. As one teacher expressed it, "In the mixed class the older fellows didn't get together, now they do." This feeling of solidarity has resulted in making discipline easier for teachers who recognized it, and harder for teachers who did not. Practically all the teachers became aware of the change as it developed and adapted their methods of control to meet the occasion.

With the younger group the stern authority of the teacher carried the day; the "ipse dixit" was appropriate and sufficient. With the mature group this class consciousness instantly arose against any punishment where innate righteousness was not apparent. The paternal method was not to be tolerated, and treatment which recognized the intelligent and reasonable manhood of the group was demanded and obtained. Discipline became fraternal; a thing belonging to the class which the class regulated for itself. The teachers came to know this quickly and adopted a method which bore all the essentials of a self-disciplining self-government. As one teacher says, "You can treat them like men now, you couldn't before, for the youngsters couldn't understand it, and besides, the shame of criticism before inferiors (the immature) made them surly."

Reaction to Studies.—The separation of the mature group made perfectly clear that this group was different, and, in the main, less successful in their studies than the immature. They are, in general, the slow students or they would have completed the school course long before. One teacher states, "They were 40 per cent. slower and intellectually clumsy." There is a general agreement among all teachers that the big boys are doing better by themselves, because they are free from the irritating superiority of the smaller boys whose success was likely to be held up to them as a pattern and example. They feel more at home, and work with a much better spirit, and will plod energetically along in a task that is given to them.

Above all, the teachers report that the older boys must be given work that appears to be reasonable. The learning of rules

and the attack of a problem from the academic standpoint bring little reaction, while the application of a principle to present or prospective experience is grasped with a positive avidity. The immature will often collect information with the same avidity that they collect postage stamps, the mature see the matter in a different light. This principle once sensed, applied teaching becomes easier and learning more rapid, and dull boys become earnest workers. Many of the teachers were so emphatic on this point that they urged the necessity of new subject matter, and different pedagogical methods, and have begun to adjust both matter and method to the problem.

The younger group are inclined to take the teacher's word for the importance of the subject and react well to the descriptive, specific and particular, while in the older group the *general* is sought and appreciated. It is evident that there is present the result of the budding of a desire, and an ability to organize knowledge upon a conceptual and reasonable basis, and to adjust the same to present experiences, rather than a characteristically immature desire, to acquire various kinds of knowledge and proficiencies which are valued for themselves and significant as acquisitions, and for which the value of *use* has but a minor appeal. This is but another way of expressing the statement found in one of my earlier reports that the "earning instinct" has arrived, and colored all intellectual processes.

Arithmetic.—A teacher who instructs both mature and immature classes, states that there are decided differences in their respective reactions to teaching; the immature will do anything you tell them to do; for instance, they will learn the rules and mechanism for doing square root without question or resistance, and will be able to accomplish the desired result. The mature group find it difficult to do anything for which they cannot see any practical value. If the problems are given a business application, however, they (in the words of the teacher) "Jump at it." The younger group are malleable and docile; but the mature must be shown something "real" upon which to base their interest. The old mixed class required the teacher to use two methods, or to use one method for only half the class at a time. The new plan gives one a chance to choose the proper material and the proper method of using it, which is different for each of the two classes.

Penmanship.—In the old plan of mixed classes the mature boys considered it beneath their dignity to work seriously in pen-

manship, for the smaller and more agile immature boys were far superior to them. "Well, he's a kid and he can do it," was the general attitude. The teacher of penmanship realized the open avenue of attack was along the vocational line, and following it enlisted the strong cooperation of his mature group. They appeared before as isolated, slow and poor performers, continually at a disadvantage; they now have the feeling of working shoulder to shoulder with their own kind, and for a common intelligent purpose.

English.—The younger group are interested in description and do it well. Their imaginations are lively, and fairy tales still retain a significance, while the older group seem to have lost the fancy which roams afield and would center their attention upon the facts of life. While their ability to describe the hypothetical, historical or the imaginative is apparently diminished, it is really made more intensive, and focused upon experience. They become more adept at exposition, and can state the import of serious matters of their own personal interest with becoming facility and directness. It is easy to interest them in the elaboration of subject matter, and difficult to keep their attention centered in analysis and syntax, which appear strongly to the immature.

In singing it was, of course, found that the mature had changed voices and this facilitated the arrangement of classes in assemblies where it was an advantage to segregate those singing different "parts."

In physical training the most apparent differences in reaction, time and in the ability to do vigorous work were noticed. What would exhaust the immature was just right for the mature, and what would fit the immature was not sufficient to stimulate the interest of the better developed. It is certainly obvious that no single period of exercise can be made to fit equally well two groups, one of which is from 30 per cent. to 50 per cent. stronger than the other. This experiment has demonstrated first the ease with which a school may be arranged upon the basis of physiological age, and the advantages which may result from it.

The results substantiate the claims made for this method in my previous reports, and may be summarized as follows:

1. Boys in a homogenous class feel more at home, and form for themselves a coherent social consciousness.
2. Consistent methods of management and discipline may be adapted to the whole class.

3. Choice of subject matter may be made appropriate to all, instead of a fraction of the class.

4. Teaching methods and manner of appeal may be chosen with the problem of but a homogeneous instead of a diverse group of students.

The whole should render school management more simple, effective and results commensurate.

The practical application of this doctrine will result in the removal of the immature from the high school where they do not belong and where their scholarship is poorer than the mature. They may be kept in a ninth year added to the elementary school. This will leave the high school to the mature alone.

The mature should be removed from the elementary school and placed in subgrades added to the high school, or in an intermediate school, where their young adult possibilities may be fostered and find unimpeded development.

500 PARK AVENUE.

TETANUS NEONATORUM.

WITH REPORT OF CASE.

BY

WILLIAM H. JORDAN, M. D.,

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(With one illustration and chart.)

TETANUS neonatorum is classified with the wound infections of the new-born because its avenue of infection is regularly the umbilical wound. A search of the text-books and literature at my disposal failed to reveal a case where infection had taken place at any other point. My excuse for reporting this case is because of the unusual manner and point of entrance of infection.

L. J. S., boy of Jewish parentage, was born Sept. 13, 1911, after a normal labor, without anesthetic or instruments. Birth weight unknown. The child was said to be well developed, well nourished, and normal in every way. He nursed well and acted in a normal manner until one week later, Sept. 20, when, according to the Jewish rite, the ceremony of circumcision was performed by a Jewish mole who, in preparing for the operation,

wore a soiled apron and finding that his knife was dull, went out in the yard and sharpened it on a piece of roof slating which he found there.

Nothing unusual was noticed in the child's condition until three days later when he became very restless. When put to the breast he would nurse a few seconds, draw his lips tight over the nipple and act as if it hurt and then pull away from the breast crying loudly for a few minutes. This would be repeated several times until the child became exhausted. Attempts to give water caused the same symptoms. The attending physician's



FIG. 1.—Reprinted from Pfaundler and Schlossmann, Vol. IV.

attention was called to this. He attributed the trouble to an obstruction of the nostrils, due to a cold and prescribed treatment for this condition. On Monday, the 25th, the physician was called in again because the child was worse and he again advised the same treatment prescribed on the previous visit. The child grew steadily worse. I saw him on Wednesday, Sept. 27, at 11:30 P. M., when the above history was elicited from the parents.

Physical Examination.—Well-developed emaciated baby fourteen days old. Facial expression was the typical risus sardonicus

facies tetanica with the skin wrinkled in deep folds on the forehead, the nose pinched, lips puckered and the angles of the mouth drawn downward. The head was retroflexed in marked opisthotonos. Attempts to move it caused convulsions and a sharp piercing cry. Anterior fontanel 3 cm. not bulging. Eyes could not be examined. Any attempt to force open the lids would cause a tight contraction of same and convulsions. Mouth and throat could not be inspected because of spasm of the masseters which caused locking of the jaws. Examination of the heart, and lungs were negative. Abdomen rigidly contracted excluding examination of the liver and spleen. The extremities were flexed. The arms were flexed tightly with the hands in position close up under the chin. His general appearance was

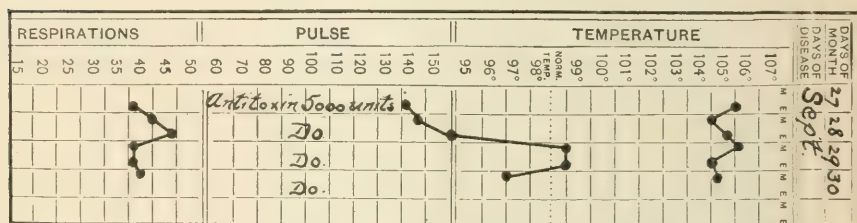


FIG. 2.—Chart of Case.

like a block of marble in the form of a baby. By taking hold of the hands, his whole body could be elevated without any change in the body lines. He also could be raised from the table by placing one hand under the occiput and the other under the heels without any change from his fixed position.

The umbilicus was healed, the wound on the penis had a gauze dressing which, when removed, was moist with a serous exudate. Wound not yet healed. The slightest handling or loud noise would cause a convulsion. Temperature by rectum, 105, pulse, 140, respirations, 40. I made a diagnosis of tetanus neonatorum due to infection through the circumcision wound and gave a hopeless prognosis.

Treatment consisted of cleansing the wound thoroughly and putting on moist sterile dressing. A lumbar puncture was made intending to inject antitoxin into the spinal canal but on account of small amount of fluid obtained (5 c.c.), I decided to use the serum intramuscularly. Five thousand units were administered

at once. Chloral hydrate, gr. iii, was given per rectum every three hours and 1 ounce of breast milk was fed by tube every three hours. Twelve hours later 5000 units more of antitoxin were administered. His condition remained much the same all day Thursday. Friday A. M., another 5000 units of antitoxin were given. His condition in the evening seemed better as far as the spasm of muscles was concerned. The arms could be moved slightly without causing convulsions. His heart was growing very weak. Saturday A. M., his condition was much worse. Radial pulse could not be obtained. The heart beat obtained with the stethoscope was 200 and very weak. This condition continued until 2 P. M. when he died of exhaustion.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of April 11, 1912.

WILLIAM SHANNON, M.D., *in the Chair.*

DR. WILLIAM H. PARK read a paper entitled:

A BRIEF STATEMENT CONCERNING THE AGENTS CAUSING MEASLES AND SCARLET FEVER.

Measles.—The microscopic examination of the blood, tissues, and fluids of the body has revealed no microorganism which can be considered of etiological importance.

Inoculation in man: Franz Mayr in Vienna, in 1848, and others about the same time, inoculated healthy children as in vaccination with a drop of blood taken by puncturing the skin during the period of outbreak of the rash and found measles to follow. In vaccinated children who had recovered from measles no infection took place. There was no local reaction. He also collected nasal mucus from a case and placed it upon the nasal mucous membrane of two healthy children. One showed catarrhal symptoms on the eighth day and the other on the ninth day, and both showed a typical exanthom on the evening of the thirteenth day. These children did not contract the disease when exposed two years later.

In 1905, Hektoen drew blood at the thirtieth hour, after the development of the rash, and inoculated a young man successfully. The skin desquamation is certainly much less infectious and probably not at all. Mayr failed in human tests and Anderson in monkeys.

Numerous investigators have tried to infect monkeys, but with only occasional success, until the recent thorough work of Anderson and Goldberger, which was afterward confirmed by Hektoen. They found the virus much less infectious for monkeys than for man. The blood carries the virus for a period from at least as early as the development of the rash, to at least forty-eight hours afterward. The same is true for the secretion of the nasopharynx. After that period it is not infectious for monkeys. This coincides with the opinion of many, that measles is not communicable after the temperature has fallen to normal.

The virus is filterable through a Berkefeld filter, resists desiccation for twenty-four hours and is destroyed by heat when exposed to 55° C. for fifteen minutes. Immunity is acquired by monkeys which have passed through the disease.

The complicating bronchitis, bronchopneumonia and coryza, are caused by the bacteria, common to the respiratory tract, engrafted on to the earlier slight inflammation due to the virus of measles.

Scarlet Fever.—The virus is as yet undetermined. It is capable of transmitting the disease in apes and possibly in the lower monkeys. Landsteiner* and Lévaditi have very recently produced in a young orang-outang characteristic scarlet fever by the combined inoculation of the tonsils and subcutaneous tissues.

They had previously produced less characteristic attacks in other varieties of the higher apes. The young male orang-outang was injected subcutaneously with 10 c.c. of nondefibrinated blood of a child suffering from scarlet fever. At the same time the animal's throat was swabbed with deposit from the tonsils. Within four days there developed reddening of the tongue and throat. Two days later the temperature rose from 37.5 to 39.5, and a slight erythema appeared on the skin of the chest and abdomen, hardly enough to call it a true scarlatinal rash. The temperature remained up for two days, then became normal and the animal appeared well.

Nineteen days after inoculation, desquamation began on the chest, extended to the abdomen and the thighs, and a little later on the hands and feet. Here the skin peeled off in large flakes. The animal died two months later from miliary tuberculosis. For a time albuminuria was present 1.2 grams albumen to the liter of urine. This cleared up before death so that it was probably due to the scarlet fever and not to the tuberculosis.

Bacteriological examinations of the skin were negative. Histologically, bits of skin excised nine days after the onset of

* Comptes Rendus Heb. des seances de la Societe de Biologie, vol. lxxii, No. 9, p. 358, 1912.

desquamation, showed lesions resembling those in human scarlatina: round-cell infiltration and polynuclear leukocyte masses around the vessel walls, leukocyte infiltration in the epidermis and polymorphonuclear deposits under the corneal layer. They failed to produce scarlatina in a large number of trials in the lower monkeys. This is similar to our own negative experience, when a year ago, we injected subcutaneously six monkeys with 10 c.c. of blood, each received blood from a different case of scarlet fever. Bernhardt and Cantacuzene, think that they have succeeded in producing the disease in the lower monkeys. The former believes he produced the disease with heart's blood, crushed tissue of lymph gland, blood and throat exudate. The nature of the virus: Most stress has been laid upon a streptococcus or a diplococcus. Mallory suggested a protozoan. The streptococcus is probably the only organism that should be seriously considered.

Streptococci are undoubtedly present in the throat in great numbers in every case of scarlet fever. They are present to some extent in the blood of all severe cases and in that of many less severe. Milk from infected cows abounding in streptococci has caused a disease hard to separate from the scarlet fever. I have personally investigated a small epidemic, where the milk of a septic cow containing great numbers of streptococci, produced a disease in some thirty boys resembling scarlet fever.

Gabritchewsky and other Russians, and two Americans believe they have produced immunity by streptococcus vaccines.

In opposition to the claims for the streptococcus we have the fact, that the condition of the mucous membranes in scarlet fever are extremely favorable for the development of the streptococcus. In our experience the streptococci found in scarlet fever have no distinctive characteristics separating them from those found in other infections. We examined cultures from many cases taken from glands, the heart's blood and from throats.

Kolmer was unable to find streptococcus antibodies in more than 11 per cent. of scarlatinal convalescents. Landsteiner and Levaditi were able to reinfect with streptococci the tonsils in apes, immune to scarlet fever. This would be difficult to understand if they caused the disease.

Bernhardt believes he produced scarlet fever with a streptococcus free material from the third animal of a passage series in lower monkeys.

Hektoen, Landsteiner, Levaditi, Bernhardt, Kolmer, Karl and Jessie Kossler and most others who have recently approached the problem from the experimental side, believe that the streptococcus is a secondary invader and that the scarlet fever virus like that of measles and typhus fever is an unknown agent. Mallory's bodies have too little evidence in their favor to be considered as the causative agent.

Bernhardt recently described small inclusions which looked like Trachoma bodies, but these like those described by Döhle, to be

demonstrated this evening by Dr. Nicoll, are probably of interest from the diagnostic standpoint rather than the etiological.

DR. MATTHIAS NICOLL, JR., and DR. ANNA W. WILLIAMS presented a communication on

INCLUSIVE BODIES IN THE BLOOD OF SCARLET FEVER AS A MEANS OF DIFFERENTIAL DIAGNOSIS.

He said that in the *Centralblatt für Bakteriologie* of November 23, 1911, Professor Döhle of the Institute of pathology of Kiel, reported that in thirty cases of scarlet fever blood examined by him he found almost without exception in the polynuclear leucocytes certain inclusion bodies which to the best of his knowledge had not previously been described. By various methods of staining these bodies could be readily differentiated from the nuclear substance even when they lay near it. The leucocytes themselves appeared normal. The number of the latter involved varied as did the number of bodies in each leukocyte. They could not be found by him after the sixth day. A large number of control cases were examined and in but three were inclusion bodies found. One of these case was pneumonia which the author thought might have been mislabelled and the others were cases of carcinoma in one of which the bodies were not typical; in the second case of carcinoma the bodies could not be distinguished from those of scarlet fever. Dr. Martin Kretschmar of the University of Strassburg reports in the *Klinische Wochenschrift*, March 11, 1912, that he had been able to confirm Dr. Döhle's work.

With the purpose of testing out the findings of these investigators the writers of the paper began work in the Research Laboratory of the Department of Health and had studied blood smears from fifty-one cases of scarlet fever, together with some twenty-five control cases, with the result that forty-five cases of scarlet fever showed inclusion bodies such as Döhle described and six failed to do so. Of the negative cases one was ill for eight days or more, two for ten days or more, one for twelve days, one for fourteen days, and one for thirty days. The great majority of the positive cases had been sick for less than a week and most of them for less than four days.

The method of examination was as follows: Two or three blood smears were made from each case, one stained with Manson's stain, another with Geimsa's stain over night. The inclusions were found chiefly in polynuclear leucocytes and varied in size and shape from small coccus forms to large irregular masses one-fifth the size of a red blood cell. Bacillary forms were also seen. With Manson's stain the nuclei took on a deep blue color, the cytoplasm very faint blue, the inclusions a tint between the two. With the Geimsa stain, the inclusions took on a clear delicate blue identical with that of the plastin. The nuclei colored magenta. With Manson's stain the inclusions stood out more clearly. In fresh cases of scarlet fever the bodies were found in nearly every polynuclear leucocyte. In their short study they

had been unable to determine how long the bodies persisted. In one case they were found on the twenty-eighth day. In general they were found during the first week at least. The control cases included three normal bloods, twelve cases of measles, three cases of diphtheria with severe urticarial rashes probably due to anti-toxin, one case of erysipelas, one case of pneumonia in an adult with lues, one case of follicular tonsillitis, and three cases of German measles. Of these control cases three only showed inclusions, namely the pneumonia case in the luetic patient, the erysipelas in the infant, and one complicated measles case, in which the diagnosis was doubtful as to whether there was a complicating scarlatina or not. With the exception of eight cases the histories of which were obtained from authentic sources, all of the cases were personally examined by one of the writers and the diagnosis clinically confirmed, but in order to eliminate the personal element the nature of the case from which the blood was taken was not disclosed to the examiner, until the findings had been jotted down. With the exceptions noted not the slightest difficulty was experienced in picking out very rapidly the cases of scarlet fever.

At the present time they thought they were justified by the results of their work in believing that a blood examination in the first week of the disease would serve to differentiate scarlet fever from measles, German measles, and probably from toxic eruptions. Whether a similar differentiation could be made in the case of rashes due to sepsis, influenza, and tonsillitis, must be left to be determined by further study. They were not ready as yet to express an opinion as to the nature of these bodies.

DR. HENRY W. BERG presented a paper on

SOME FEATURES OF SCARLET FEVER AND ITS COMPLICATIONS.

The classification of scarlatina into severe, moderately severe, and mild cases, with hemorrhagic cases as a separate group was obviously open to many objections. He had substituted for it a classification useful for the purpose of grouping various clinical types of the disease and one which was based upon essentially clinical characteristics. Scarlatina was generally a toxic disease at the same time that it was an infectious one. The classification which he had adopted was therefore based upon the degree of toxicity, an essential phenomenon of all cases. This classification was as follows: Scarlatina simplex which might be either mild or severe; severe toxic scarlatina which might be hemorrhagic or nonhemorrhagic; scarlatina with mixed infection, or septic scarlatina. Surgical scarlatina if looked on as really a scarlatina would belong to the severe toxic scarlatina. He considered it a septic manifestation and therefore not a scarlatina at all, but simply general sepsis with an erythematous rash. The essential clinical distinctions between these different groups of cases was based upon the fact that in the simple scarlatinas the emunctories of the body were able to get rid of the toxic materials produced

as fast as the pathogenetic forces manufactured them, while in toxic scarlatina the body tissues were more or less inundated by the excess of toxic accumulations which the protective and extruding forces of the body had been unable to neutralize and expel. When the case showed in addition to the purely toxic phenomena the symptoms of infection with the pus producing organisms such as the streptococcus, staphylococcus, etc., resulting in inflammatory complications of various organs and tissues, either in the beginning or in the course of the disease, there was a clinical entity so different from the purely toxic picture of the disease as to make a separate grouping clinically useful, and hence the classification of septic scarlatinas.

All that the writer claimed for this classification was that it was not arbitrary but relied upon essential clinical and pathogenetic differences and was therefore convincing and useful in the logical consideration of the disease.

The eruption of scarlatina had many points of interest. It was sometimes very difficult to differentiate it from the toxic scarlatiniform erythemas, such as some of the serum rashes. One factor that was helpful in differentiating these skin lesions was that the toxic scarlatiniform erythemas lacked uniformity. Toxic erythemas had here and there urticarial and morbiliform patches. One patch of urticaria in an otherwise scarlatinaform eruption would throw doubt upon a suspected scarlatina. In the desquamative stage of the eruption the diagnosis of scarlatinal desquamation was readily made by one who had seen this characteristic desquamation. The desquamation of scarlatina might be confounded with that of dermatitis desquamativa or the pseudo-desquamation of some types of eczema. It could never be confounded with that of measles which was much finer and branny in character. The differentiation of scarlatinal desquamation from that of the various types of desquamative dermatitis was readily made by remembering that the skin that had recently been spontaneously freed from the squama of scarlet fever was soft and velvety to the touch and perfect in texture while in desquamative dermatitis the underlying skin was rough and hard and in some of the conditions covered with a moist exudation.

The anginas of scarlet fever fell naturally into three groups. First, toxic angina due to the toxic causes of scarlatina *per se* and present to a greater or less extent in every case of scarlatina; second, septic angina due to the complicating influence of the pus organism upon the basic toxic angina; third, diphtheritic angina due to the complicating influence of the Klebs-Loeffler bacillus upon the first and second groups. Toxic cervical lymph adenitis was a manifestation to a greater or less extent of every case of scarlatina. The most marked adenitis was apt to be present in the septic cases. Enlargement of the glands might lead the patient to hold his head in a position simulating cervical rigidity and pseudoopithotonos, which had to be differentiated from similar symptoms present in a complicating meningitis.

The clinician received much aid from accurate graphic curves of temperature and the rates of the pulse and respiration in a case of scarlet fever. In a general way any extensive rise or fall from the level maintained during the fastigium, or a rise interrupting the progressive lytical resolution indicated an intercurrent or complicating condition and was not to be looked upon as an essential part of the scarlatinal pyrexia. The day when lysis began could safely be taken as the fifth or sixth day and then one had a clue to the duration of the disease before coming under observation. A sudden rise during the lytical stage indicated the existence of a complication which the competent physician would find sooner or later. Frequently the variety of the complication could be recognized by the character of the curve together with the change in the rate of the pulse and respiration. Increase in rapidity of pulse and respiration with a somewhat septic fever curve might point to a bronchopneumonia; a suspension of the lytical temperature curve with greatly increased pulse rate and only moderate increase in respiration frequently indicated a cardiac complication; an increased fever curve of septic character with a lower pulse rate than the height of the fever called for, frequently indicated a meningitis or a meningismus attending the otitis media or mastoid.

An acute glomular nephritis would be characterized by a temperature above the figure normal to the stage of the disease in which it sets in together with a lower pulse rate than was called for by the temperature in the case. Nephritis was not as frequent a complication in hospital cases as in those in private practice; this was probably due to the fact that in the hospital the patients were kept in bed until desquamation was almost complete and they were kept on a fluid, mostly milk diet, until they were well past the stage of acute symptoms. In Willard Parker Hospital during 1910 and 1911 there were 4286 cases of scarlet fever, 17 per cent. of which showed albumen in the urine, with only ninety cases of real nephritis. Very rarely indeed was post scarlatinal nephritis seen to begin in the post desquamative stage. When it occurred this late its beginning had been overlooked or it was a nephritis complicating one of the complications of the scarlet fever. In cases of severe nephritis there was pyrexia due to the nephritis and also a myocarditis with rapidly developing hypertrophy of the left ventricle and pulse of high tension. Pathologically these cases in their beginning were cases of glomerular nephritis. Many of these cases that recovered as well as those that died developed the lesions of acute parenchymatous nephritis. The important point in these cases was that once improvement began, it was apt to go on to recovery or to the production of chronic interstitial nephritis without acute symptoms and the prognosis was changed from an extremely grave one to a good one as regarded life. A point Dr. Berg emphasized was the critical resolution in these cases, a crisis almost as evident as that of lobar pneumonia.

DR. LOUIS FISCHER read a paper on

THE TREATMENT OF SCARLET FEVER: PROPHYLACTIC,
DIETETIC, MEDICINAL, AND SERUM THERAPY.

He stated that it was impossible to lay down specific rules which would apply to all cases of scarlet fever. One was compelled to study and individualize each and every case to be successful. The principal aim of treatment should be the prevention of complications, if such was possible. Rest in bed for five or six weeks was imperative whether the case was mild or severe. This would prevent nephritis and support the heart and in a large measure prevent cardiac complications. Allowing the child out of bed during the first week or ten days of illness was responsible for many fatal complications, especially of the lungs and ears.

Elimination of toxins, through the skin, kidneys, and bowels, was of the greatest importance as the toxin of scarlet fever did not stimulate peristalsis. The daily administration of a teaspoonful of cascara elixir alone or assisted by a soap water enema should be a routine performance. As the toxin of scarlet fever disturbed the secretion of the kidneys it was advisable at the very beginning of the treatment to give from 10 to 15 grain doses of citrate or bi-tartrate of potassium, in addition to a little lemonade to stimulate diuresis, several times daily. In septic cases active catharsis should be maintained and calomel or podophyllin should be given each day. High colonic flushings with one drachm of inspissated oxgall added to one pint of tepid water would produce thorough intestinal cleansing. The toxins inhibited the internal secretions and because of this condition the ductless glands, the adrenals, and the thyroid did not functionate. Hence excellent results followed the administration of adrenalin as well as of thyroid.

In the treatment of the fever one should seek the cause but should not give antipyretics as they depress the heart, mask the symptoms, and disturb the clinical picture. If pyrexia caused delirium a hot mustard bath would allay irritability, and if convulsions appeared, lumbar puncture should be employed to relieve intracranial pressure. The temperature could be reduced by a laxative such as citrate of magnesia, which in addition was a good diuretic and quenched thirst. In case of hyperpyrexia due to a severe infection rapid reduction of temperature was effected by washing the colon with one quart of tepid saline solution. The use of a 5 per cent. formalin spray in the nasopharynx would destroy bacteria which were liable to persist in the lacunæ of inflamed tonsils for many days or weeks. This treatment could be continued several times daily throughout the disease if one wished to prevent reinfection. The installation of a few drops of a 5 per cent. solution of formalin into the nostrils, twice a day was useful as a prophylactic early in the disease. In the Willard Parker Hospital they found that the routine practice

of administering 1000 units of diphtheria antitoxin to every case of scarlet fever entering the institution had reduced the complication of diphtheria by at least 25 per cent. If diphtheria developed the administration of an additional 5000 units of antitoxin was indicated, to be repeated if necessary. If in a severe case of scarlet fever the odor of necrosis was present, 5000 units of antitoxin should be injected in the beginning of treatment, regardless of the presence or absence of the Klebs-Loeffler bacillus. Anaphylactic shock should always be remembered when employing large doses of antitoxin.

Loose necrotic patches and postnasal discharges were a source of danger to the Eustachian tube and it was important to wash the nasopharynx with a normal saline solution morning and evening or oftener. Following such washing Dobell's solution or 20 per cent. argyrol solution would disinfect the nasal passages and in some cases prevent aural complications.

Daily examination of the middle ear should be made as otitis could thus be recognized early and treated before it had extended to the mastoid cells. Excepting in rare instances the writer was not in accord with the too prevalent idea of operating on the mastoid for ordinary mastoid tenderness. A free incision into the drum was sufficient as a rule to relieve the tension of an acute otitis media. If bulging persisted another paracentesis should be performed and thorough drainage thereby established. The external application of a hot water bottle or a hot poultice would frequently aid in absorbing mastoiditis. In the writer's experience the ice-coil and the ice-bag had given no satisfaction.

When cervical adenitis existed a careful inspection of the nasopharynx and the middle ear should be made. If they could exclude such complication, a warm flaxseed poultice and the daily inunction of compound iodine ointment rubbed into the glandular tissue once daily had proved efficacious. This treatment is applied only to hard, nonsuppurative glands. Catarrhal discharges due to the streptococcus and gonococcus demand strict hygienic measures. The installation of a 20 per cent. nitrate of silver solution, by means of a medicine dropper into the vagina, was usually sufficient to destroy the gonococci. He also advised a daily douche of one pint of tepid water to which 1 drachm of powdered alum and 1 drachm of borax had been added. He had tried the injection of 50 to 100 million gonococci in the form of a vaccine in the treatment of vulvo vaginitis but he had found that the gonococci persisted. In cases of multiple furunculosis due to the staphylococcus, almost specific results followed the injection of an autogenous vaccine containing from 50 to 100 million bacteria.

In regard to serum therapy there was no specific serum in use today because neither the etiology nor the bacteriology of the disease was understood. Although Moser's antistreptococcic serum showed specific results within twenty-four to forty-eight hours, this had not been the case with antistreptococcus serum

or with streptolytic serum in this country. No specific action could be traced to these serums. With regard to erysipelas complicating scarlet fever, the local treatment with Burrow's solution or the use of 20 per cent. aqueous ichthyol solution was good in some cases. He had seen excellent results from the application of pure alcohol, the saturated gauze being covered with oiled silk. The supersaturated solution of magnesium sulphate had been successfully used at the Willard Parker Hospital and was worth recommending.

When pertussis complicated scarlet fever, large doses of codeine should be given, one-eighth to one-quarter of a grain every three hours for a child from one to two years of age. When codeine failed, sodium bromide combined with chloral hydrate might be tried.

No complication of scarlet fever was more dreaded than measles, because of the danger of bronchopneumonia, croup, otitis, and empyema. Exposure to cold draughts in bronchopneumonia ended fatally. Warmth or moderate temperature was well borne.

Daily supervision of the urine would be the guide for an early diagnosis of acute renal congestion. Suppression of urine demanded the application of dry cups twice daily, followed by a warm bath at a temperature of from 102 to 104, for about two minutes after which the patient should be wrapped in a warm bath towel and covered by warm blankets. A cup of warm tea or hot lemonade would stimulate both diuresis and diaphoresis. This active treatment should be repeated every twelve hours until acute suppression subsided. Agurin, diuretin, and theocine, two to five grains for a child three to five years old, might be given three times daily. The salt-free diet so plausible in theory had not proven useful in practice.

Bronchopneumonia or lobar pneumonia complicating scarlet fever were best treated by placing the patient in a large room with plenty of fresh air, avoiding draughts. When placed out of doors these patients did badly. The roof treatment was dangerous.

If empyema complicated scarlet fever, paracentesis should be resorted to to relieve the purulent exudate. The shock of operation should be avoided. The surgeon should be called early in the disease and if possible local anesthesia should be used.

The heart should be carefully watched. Myocardial insufficiency could be avoided by judicious diet and continuous stimulation. Strychnine should be given early in the disease before the heart showed weakness. Caffein sodium benzoate, 1/2 grain, was an excellent diffusible stimulant. Digitalis was dangerous. Digitoxin, sold in drug stores as digalin, in five to ten drop doses three or four times daily, would support a weakened heart. The indiscriminate use of whiskey as a routine treatment should be condemned; in large doses it irritated the kidneys. Better results could be obtained by using an injection of ten or twenty

drops of a 1-1000 adrenalin solution, repeated every hour until the proper effect was noted. The temperature would be found of no service in estimating a cardiac complication. The presence of muffled heart sounds or a bruit were indications of impending cardiac weakness.

When symptoms of collapse were noted, the injection of five to ten drops of camphorated oil (20 per cent. camphor in oil) would prove beneficial and should be repeated until the desired effect on the heart was noted.

In feeding, the fat and casein content of the food should be reduced to less than the normal patient required. It was his rule to give milk diluted with an equal quantity of water, sweetened whey, or fat-free milk fermented with the Bulgarian bacillus. In cases in which milk was not well borne, vegetable protein in the form of split pea soup might be tried. Liberal quantities of water should be given, likewise fruit juices, orange, pineapple, lemon, and grape juice, might be given with advantage. This light diet should be used until the acute febrile process subsided. After convalescence was well established they might give whole milk or carbohydrates such as well-steamed farina pudding, tapioca, cornstarch made with milk and sugar but without eggs. Meat was too stimulating and should be excluded from the dietary.

DISCUSSION.

DR. JOHN A. KOLMER, Professor of Pathology, Philadelphia Polyclinic, said he was especially interested in the pathology of the infectious diseases and he was very sorry that he could not add to the question regarding the inclusion bodies except to state that all of us recognized the importance of such findings if they would hold good in differentiating true scarlet fever and the scarlatiniform serum rashes. These were the rashes that had given them a great deal of trouble in Philadelphia during the past year. There should be some way by which they could make a diagnosis from a clinical standpoint. The relation of streptococci to scarlet fever had for many years engaged a great deal of attention and his personal views in regard to the streptococci corresponded with those expressed by Dr. Park, that the streptococci were secondary invaders. There was one fact that should be recognized, that the scarlatinal virus produces in the blood some condition which very much favors the growth of the streptococci in the blood and organs of scarlet fever patients. Certainly one is able by bacteriological investigations of the various organs and blood of scarlet fever patients to note and be struck by the large per cent. of the cases showing streptococci and they seemed to possess certain characteristics which broke up under prolonged observation.

The question of streptococcic immunization in the prevention of scarlet fever is worthy of special mention. It is true that such immunization would prevent scarlet fever, then it may be

contended that streptococci are the cause of the disease. The Russians had worked upon this subject for many years and the last publication appeared about two years ago. The Russians made many thousands of administrations of the vaccine. Reading their literature one is impressed with the value of the method but from an experimental standpoint the method is not of value. The vaccine is given three times at intervals of one week. Experimentally a bacterin prepared and administered as they advise did not materially raise the streptococco-opsonic index of the blood. Dr. Kolmer immunized about 350 people in Philadelphia one year ago by the Russian method; fourteen of these cases developed rashes suggestive of scarlet fever. If the vaccine increased the opsonic content of the blood it might do good. At least it is likely to mitigate the severity of secondary complications. However, scarlet fever is such a protean disease and manifests itself in so many ways that it became at once a very difficult disease to trace and the Russian reports must be viewed with healthy skepticism.

In regard to the treatment of scarlet fever, we have tried in Philadelphia the use of the antistreptococcus serum. A horse was immunized with streptococci taken from scarlet fever patients. We do not know how the serum acts. It is probably not bacteriolytic. It was most important to standardize the serum. There certainly were some cases that were benefited by the antistreptococcic serum and there were others that were not. It was not possible to say what cases would be benefited and what cases not. If one had the serum on hand it should be given in these cases, especially in the septic cases of scarlet fever. The presence of the streptococci could be determined in the blood by blood culture.

Dripping saline solution into the rectum was a very valuable treatment for the severe septic cases of scarlet fever; this seemed to dilute the toxins of the disease. In a certain percentage of the cases this method of saline infusion seemed to be of some special benefit. This was also true in the treatment of diphtheria, but this should be combined with the use of antitoxin.

Dr. Kolmer said he had been interested for some time in the rhinitis which developed in scarlet fever patients; the virus of the disease was present in the secretions of the upper air passages. When one sent a patient home after an attack of scarlet fever with a running nose, there was a risk of "return cases." In Philadelphia they had treated 200 cases of septic rhinitis by means of bacterins; this was not designed to combat the scarlet fever virus, but was in fact designed against the superadded infection. When this infection was cured, the virus would die because of insufficient pabulum. There were a large number of cases showing the presence in the nasal secretion of staphylococci and in these cases stock bacterins would give very satisfactory results. Their experience with bacterins in discharging ears was not so good.

DR. HENRY DWIGHT CHAPIN said there were only two points upon which he wished to dwell, first, one feature in the diagnosis; second, a complication often overlooked in scarlet fever.

1. *Diagnosis.* The question of the diagnosis between scarlet fever and the scarlatiniform rashes occurred occasionally and was often quite difficult when there was tonsillitis present. They did meet with ephemeral rashes, and they were most difficult to recognize in some cases and the general practitioner especially was much confused by them. The following point Dr. Chapin thought very helpful in making a differentiation. He could not always differentiate between a tonsillitis of scarlet fever and an ordinary tonsillitis; there was no essential distinction. However, in real scarlet fever there were certain points to aid them in making this differentiation. First, there was the condition of the tongue. On the first day of the disease it would be found to be covered with a white fur and the papillæ could be seen coming through. On the second or third day it would clear up at the tip and edges and then there would be found the typical beef tongue. Second, there was the punctate form of eruption which was marked over the soft palate and this they did not get even in the most severe attacks of tonsillitis. These two features he always tried to bring out in making differential diagnosis of these conditions.

2. *Myocarditis* was more common in scarlet fever than was generally supposed, probably because it was not more often recognized. Even after a mild form of the disease, in two or three weeks the pulse will be noted to run up and instead of being 70 or 80 it would be 90, 100 or 120 and remain there. When this occurred the heart should be carefully watched and one should always think of myocardial involvement. Mild cases of myocarditis were not recognized by the general practitioner as a rule. One should examine the heart very carefully and keep a record of the pulse. If there were evidences of a myocarditis one should be very careful of his patient.

DR. ARTHUR RICHARD BRAUNLICH believed that it was very difficult to see anything very characteristic about the desquamation in scarlet fever; he had seen patients with measles desquamate as did those suffering with scarlet fever. He did not believe there was anything at all characteristic about the desquamation in scarlet fever.

As to scarlet fever occurring as a mixed infection, he asked them to consider a child with a high temperature, with measles, with a bronchopneumonia in whom scarlet fever developed. In such a case the diagnosis was made not on the rash but on the condition of the throat and tongue.

The majority of the cases of scarlet fever did not have a typical temperature curve; the slightest enlargement of a gland was sufficient to change the temperature curve.

With regard to the tongue, very often it was the most typical thing met with in scarlet fever, the typical strawberry tongue

which appears on the fourth or fifth day and which was present in such large percentage of the cases. In about 23 per cent. of the cases the diagnosis depended upon the punctate eruption, the temperature and the pulse rate. The toxic eruptions that appeared after the giving of various sera could not be differentiated from the scarlet fever eruption; everybody recognized that.

As to the treatment, plenty of water should be allowed in order to get a diuretic effect; if enough was given to a child twelve or fifteen years of age he could be made to pass 150 ounces of urine a day. Dr. Braunlich had scarlet fever eight or nine years ago and he instructed his nurse to give him plenty of water and he passed 400 ounces of urine a day. If one gave plenty of water at the beginning of the disease he believed that it would prevent many of the complications which otherwise would have occurred. His nurse had enough to do to bring him water and carry away water.

DR. LEWIS A. SEXTON, said that he believed one of the most convincing points in the differential diagnosis of Scarlet Fever is the vasomotor paralysis caused by pressure. This paralysis lasts for two or three seconds and the skin again assumes its original color to again blanch after a lapse of from five to eight seconds after which it remains blanched for several seconds, and in some cases where the erythema is intense, it can be noted for several minutes. This condition is present in a large percentage of scarlet fever cases, but is never found in the serum therapy rashes or scarlatiform erythemas other than scarlet fever.

A very common, and a most painful complication in scarlet fever which had escaped mention was arthritis. In the Willard Parker Hospital, this complication occurred in 7 per cent. of the cases. In 1911 there were 1984 cases treated and of these 147 cases had arthritis with the following involvement: Wrists 110, elbows twenty-six, shoulders thirty-one, knees fifty-seven, shoulders suppurative two, elbows suppurative one. In the suppurative shoulders, a pure culture of gonococcus was obtained from each (these being specific vaginitis cases).

In the other cases the organism found was streptococcus. Relative to the temperature curve in scarlet fever he had noted with much interest in the early stages of the disease, that the pulse rate was out of proportion to the temperature, that a rapid pulse was one among the first manifestations of the disease. The rapid pulse often persisted for several days after the temperature had reached normal. While the results at Willard Parker Hospital had been very satisfactory, in his opinion if each patient could have more individual attention and the nose and throat kept clean and swabbed out with a 25 per cent. argyrol solution two or three times daily this would reduce to a marked degree the complications.

There were admitted during the year 1911, 104 cases of scarlet fever complicated with diphtheria. Positive cultures developed

during the year, 161, and additional antitoxin was administered to 294 cases.

As to nasal irrigations and the fear that this form of treatment might infect the middle ear, he thought this danger had been overestimated. In the diphtheria service where 1558 cases were treated in 1911, and 327 cases had had nasal irrigations and not a single mastoid had developed. This might be due, however, to the fact that the facilities for this form of treatment were the very best, and that the treatments were carried out by experts. He did not see why the middle ear should be any more endangered by these nasal irrigations in scarlet fever.

With regard to mastoids he believed that with free incision of the tympanum as soon as any bulging appeared and the application of the ice-coil for twenty-four hours. A great many of these mastoids that would have otherwise gone on to operation could be aborted.

After the irrigations of the ear they employed equal parts of a 1-5000 solution of bichlorid and 50 per cent. alcohol, putting ten drops of this solution warmed into each ear with apparent benefit.

As to the vaccines in the treatment of gonococcus infections, the only results they had seen were ephemeral. One might diminish the discharge for a week or ten days or by large doses of gonococcus vaccine stop the discharge, but this was not permanent; at the end of ten days or two weeks the discharge would return.

With regard to the treatment of nephritis they had comparatively few cases. In 1910 they treated 2302 cases of scarlet fever and had only fifty-six cases of marked nephritis, but 17 per cent. of the cases showed albuminuria. In 1911, they treated 1984 cases and had thirty-four cases of marked nephritis with 18 per cent. of cases showing albuminuria.

They accounted for the small number of cases by the strict regime in diet which was limited to milk or fluids for the first eighteen to twenty-one days, during which time the patients were kept in bed. For the treatment they relied on eliminatives and hot packs and hot baths. Maximum doses of nitroglycerin were given one-half hour before each pack as a vasomotor dilator to increase the diaphoresis.

DR. PHILIP D. KERRISON said that the chairman, in asking him to take part in the discussion, had requested that he confine his remarks to the indications for the mastoid operation in cases of aural lesion complicating the infectious diseases. In the majority of the cases the mastoid operation is undertaken not so much on account of the urgency of the immediate symptoms as for the purpose of preventing certain dangers which the mastoid lesions imposed upon the patient. These dangers might be considered under two heads, viz.: 1. Those inherent in a rapidly-spreading suppurative mastoiditis which might endanger the patient's life either by its own severity or by intracranial compli-

cations to which it might give rise; and 2. the truly remarkable rapidity with which the drum-membrane in these cases may be destroyed.

It is well known among aural surgeons having large experience with the infectious diseases that purulent otitis complicating the infectious diseases, and particularly those complicating scarlet fever, are frequently accompanied by very rapid destruction of the drum-membrane. This is an important fact which is not fully appreciated by the medical profession at large. It may be illustrated by an experience of last summer in the Willard Parker Hospital. In July the speaker was asked to examine a number of cases having aural complications, about eighteen in all. Having carefully examined them, five were selected as calling for operation. One of the visiting physicians questioned the wisdom of operating on so many cases at this season—*i.e.*, the season of excessive heat—unless the symptoms were exceedingly urgent. Dr. Kerrison asked him to see the cases in consultation. In three of them the evidences of pus requiring evacuation were unmistakable; the other two were cases of more moderate grade, with some mastoid tenderness, drum-membranes intact except for comparatively small perforations through which pus persistently flowed. It was explained that the purpose of operating in these two cases was chiefly to drain the tympanum from behind and save from destruction the drum-membranes which might still regain a normal condition. As a result of the consultation, however, it was decided to defer operation in these two cases, and try further the effect of nonoperative measures. This was in July. In the latter part of August Dr. Kerrison was again called to pass upon these cases. In both instances the drum-membrane was completely destroyed, the ear filled with polypi, the condition being now one of chronic suppurative otitis which the simple mastoid operation would be quite helpless to relieve.

As to the indications for operating, there are so many conditions—*e.g.*, presence or absence of adenoids, the constitutional condition of the patient, the environment, *i.e.*, whether in a well-appointed home, a hospital ward or a tenement—which influence the prognosis in any given case that it does not seem wise to lay down dogmatic rules for surgical intervention.

This much, however, is known: The so-called mastoid antrum in a very young child is usually as large as in the adult. The mastoid cortex on the other hand—*i.e.*, the bone covering the antrum and the mastoid cells—is comparatively very thin. Any severe suppurative lesion of the mastoid is likely, therefore, to be followed early by mastoid edema or subperiosteal abscess. Either of these conditions usually indicates the presence of pus within the mastoid cells. Postauricular redness and swelling in these cases may be regarded, therefore, as positive indications for opening the mastoid.

There are other cases of severe purulent otitis media in which the very persistence of the tympanic symptoms—*i.e.*, red and

infiltrated drum-membrane through which a copious discharge persistently flows—in which we are obliged to operate upon the mastoid for the purpose of preventing destruction of the ear. In such cases the mastoid operation simply drains the tympanum through the mastoid wound and allows the drum-membrane and middle ear lesion to heal while the postauricular wound is undergoing repair.

It would, of course, be easy to give an extended list of indications for opening the mastoid—beginning with mastoid tenderness, or sensitiveness to pressure. Even this, however, is a physical sign which is to be differently interpreted in different cases. It is a subject, therefore, in connection with which dogmatism should be avoided.

DR. THOMAS ALLISON SMITH said he had been asked to discuss empyema which followed scarlet fever. During the past two years there were admitted to the Willard Parker Hospital something like 6300 cases of scarlet fever and among these there developed seventeen cases of empyema, less than three per thousand cases. As most of these cases occurred in children under the age of ten or five years, if they should confine the statistics to these cases, the relative number of cases of empyema would be increased materially, but at no time did the statistics of the past two years give as much as 1 per cent. This was a surprise to him for he believed that scarlet fever was a disease which more frequently had empyema as a complication. Empyema was a late rather than an early complication of scarlet fever. Their statistics at the Willard Parker Hospital showed that this complication appeared as a rule about the fifth, sixth or seventh week and it might complicate a pneumonia, or it might occur independently. The records showed that these cases of empyema were apt to be but part of a general septicemia. The mortality was high, not due so much to the empyema *per se* as it was to the fact that this complication occurred in very young and very sick children.

Since the first of the year they had a large number of cases of scarlet fever and among them four cases of empyema. One of these was found postmortem. The other three were operated upon and there were two deaths; both were profoundly septic. In one the empyema complicated scarlet fever which was already complicated by measles, facial erysipelas, pneumonia and nephritis. Was it any wonder this child died? Streptococci were recovered from the pus from the empyema. Another patient was not at all sick and as soon as the pus was drained by a simple incision the patient made a prompt recovery. From the pus in this case pneumococci were found.

With regard to the surgical treatment, in adults and in older children satisfactory drainage of the empyema could best be accomplished by the excision of a section of one or more ribs. But the empyemas they met with at the Willard Parker Hospital occurred in very young and sick children and such a procedure

was not advisable. It seemed to him that an operation without the employment of an anesthetic was far more preferable than one which entailed a great deal of shock. So far as drainage was concerned it was perfectly satisfactory in these younger children and without removing sections of one or more ribs.

DR. JOSEPH E. WINTERS said that it was impossible to intelligently discuss the treatment of scarlet fever without bringing it down to the treatment of the individual case. One of the greatest authorities has stated that, epidemics differ as much in fatality as the flea bite and the plague.

At one time they were confronted with a grave disease; at another time it was so mild as to scarcely deserve the name of disease. One of the things for consideration in the grave cases was the temperature. In virulent cases of scarlet fever, it was his experience that such cases were virulent always from the onset; there was high temperature, rapid pulse, delirium, vomiting and diarrhea, when all are present they are uncontrollable. Sometimes the high temperature was best treated by warm sponging, sometimes by cold. Warm sponging should be used first; if this failed to affect the temperature, one should not hesitate to use cold packs.

Dr. Winters reported the case of a nurse with scarlet fever with a temperature between 106° and 107° F. The cold pack was employed, and he always felt that her life was saved by this measure; it was almost magical the manner in which the temperature responded.

He reported the case of another nurse with scarlet fever with a high temperature and delirium; in this case the application of cold had no effect. She was wildly delirious and the question arose, what could they do for the delirium? He ordered $1/3$ grain of morphine and $1/8$ grain of strychnine to be given hypodermically. The latter was ordered in that large dosage because the pulse was bad. She went to sleep, and slept for nearly twenty-four hours; the delirium passed away and she made a good recovery.

He was called in consultation to see a young lady, sixteen years of age, with uncontrollable delirium and high temperature, and on this patient everything but morphine had been tried without avail. He ordered $1/4$ grain of morphine to be given hypodermically. After one hour there was no abatement of delirium, and the same dose was repeated. One hour later a little chloroform was given by inhalation. She went to sleep and slept for twenty-four hours. When she awakened she had a normal temperature, no delirium, and the symptoms did not return.

There are other similar conditions where such treatment would be wrong. When to use one treatment, and when to use another is a matter of experience. Sometimes large doses of alcohol were of value, but those should never be given except late in the disease because it was absolutely contraindicated in the early stages.

A boy about ten years of age was admitted last winter to the Willard Parker Hospital with a very high temperature, bad pulse, delirium; the condition simulated meningitis. Two drams of whiskey were given every two hours. The improvement on the next day was not satisfactory so he was given two drams of whiskey every hour, and he made a good recovery.

Dr. Winters was called to the Bronx in consultation a few weeks ago to see a baby in arms in the same condition. The patient was in the second week of the disease. He ordered one dram of whiskey every hour, and every symptom improved under this large stimulation, and the child made a good recovery. These conditions occurring late in the disease he believed should be treated with alcohol in large doses; if such doses were given to a normal child they would produce almost if not quite an intoxication.

In the treatment of adenitis in scarlet fever, at the Willard Parker Hospital they had tried almost everything. If seen at the very inception ice should be applied. Ice applications should not be continued for more than twenty-four hours. At the end of the twenty-four hours, if the adenitis continues to increase, hot flaxseed poultices should be applied.

In all these cases of adenitis, get a clean tongue. If the case was carefully watched and the tongue kept clean from the beginning to the end of the disease, one would almost never see a case of adenitis in scarlet fever. See to it that the tongue is kept clean.

The arthritis of scarlet fever he believed to be rheumatism, and he believed it because it selected the same joints, because it occurred more frequently in girls, because the same diet influenced the arthritis of scarlet as it did rheumatism.

With regard to nephritis, it was his experience of a life time that if the child was kept in bed, with proper attention given to the skin, under proper diet, with a proper location of the bed, such a child would not develop a nephritis. If these precautions were taken in the hospitals they would seldom if ever see a case of nephritis. However, when one stepped in the doorway of the ward you could see the children jumping in and out of bed, and they could not be controlled except by placing a nurse at each child's bed, and even that sometimes would not keep the child in bed. There was an exposure in every hospital which could not always be controlled. All their cases of nephritis were of the glomerular type, with suppression, bloody urine, sometimes only turbid urine. They were usually in this condition when brought to the hospital.

Dr. Winters said he was much impressed with a statement made by Dr. Claude Buchanan Ker of Edinburgh. A young man had been trained by him so that he could take charge of a new hospital for scarlet fever patients. The first sixteen or twenty patients all developed nephritis. It was found that there were transoms over every bed. They were all closed and sealed, and

no more cases of nephritis developed. These were cases of glomerulo-nephritis. Such cases begin with an intense congestion of the Malpighian tufts; these Malpighian tufts are capillary plexuses in the capsule of Bowman, which was the dilated end of the convoluted tubule. Therefore this distention would cause a rapid suppression, and there would rapidly follow edema.

The best treatment for these cases of nephritis he believed to be purgation and diaphoresis, but digitalis should not be employed. Digitalis increased the distension of the afferent vessels and aggravated the pathological condition. Dr. Winters said he would be inclined to use aconite as in other congestions. Sydenham had stated that aconite was the only drug of value in the treatment of cases of nephritis which complicated scarlet fever.

REVIEW.

SCARLET FEVER. By HOFKAT PROF. DR. THEODOR ESCHERICH UND BELA SCHICK, in Wein. Alfred Hölder, Wein und Leipzig, 1912.

This monograph of 257 pages presents in some detail our present knowledge of scarlet fever. Special sections are devoted to the epidemiology and history of the disease. The chapter on etiology is complete but contains little that is new. The writers believe that streptococci play a definite rôle in the clinical manifestations of the disease, which is shown by complement deviation and agglutination tests. They do not believe, however, that streptococci are the direct cause of the disease. Mention is made of the various protozoan like bodies described by Pfeiffer, Doehle, Mallory, Duval, Prowazek and Gamaleia but the etiological relationship of such bodies is considered questionable.

The secretions from the nose and throat are considered the only important means by which the disease is disseminated; the epidermal scales are infectious only when they are contaminated with these secretions. Case of unrecognized scarletinal sore throat in older children and adults which are accompanied by a slight rash or no rash at all, are thought to be of great importance in spreading the disease. The importance of milk and fomites is discussed.

Excellent descriptions are given of the complications; those devoted to the joint and cardiac complications being of especial interest.

Perhaps the most interesting section of the book is that dealing with the post scarletinal affections. The most common of these are fever unaccompanied by physical signs, lymphadenitis and nephritis. Less common are synovitis, endocarditis, skin eruptions, sore throat and a true recurrence of the disease. These

complications occur rarely if ever before the twelfth day of the disease or later than the seventh week; the usual time of their occurrence is from the nineteenth to the twenty-second day. The writers seek to explain these complications on the basis of hypersusceptibility or anaphylaxis. This view although very attractive has little direct evidence in its support except that these affections usually occur a definite time after the acute affection, which is more or less characteristic of anaphylactic phenomena (time required for sensitization).

The chapters on treatment contain little that is new but much of general interest. It is advised that even the mildest cases be kept in bed for four weeks and the patients given a meat free diet for at least two weeks. The writers quote the interesting results of Pospeschill who found that the incidence of nephritis was no less in patients fed on meat free diet than in those fed meat and broths. Pospeschill kept a series of 1186 patients on a meat free diet and the same number were given a general diet containing meat and broths. Nephritis occurred in 9.78 per cent. of the former and in 9.95 per cent. of the latter group. In spite of these figures the writers believe that a meat free diet is safest and that such a diet has at least the advantage of containing less salt.

The opinion of the Moser antistreptococcic serum is on the whole rather favorable and explicit directions are given for its use. Owing to the large amount of serum used severe serum sickness is not infrequent and in patients whose general condition is poor, may prove fatal. The writers therefore advise that the serum treatment be reserved for the severe cases and as a rule should be given only on the first three days of the disease. It should be used on the fourth and fifth days only when the toxic symptoms are pronounced and the infectious manifestations not intense. Experience has shown that the serum has little influence on the infectious complications. It is also stated that the serum has no influence on the manifest streptococcic processes but affects only the toxic symptoms. It seems to act as an antitoxin and has influence on the causative agency of the disease only at the beginning and not when it has reached the height of its development.

A salt free diet is advised in the treatment of nephritis. Such a diet has value in preventing edema and the patients ingest smaller amounts of water so that there is less likelihood of fluid retention.

The book contains a number of plates and charts and clinical histories are frequently used to illustrate special points. A complete bibliography is appended.

It is impossible to do justice to a monograph of this size in a short review; to do so would require a complete translation. One only regrets that books of this type so rarely appear in the English language.

MILK MODIFICATION CARD. By JAMES HERBERT YOUNG, M. D.
F. H. Thomas Co., 691 Boylston St., Boston.

By means of a perforated celluloid case with two celluloid cards Dr. Young has arranged a system by means of which a great number of milk and split protein formulas can be made. The amounts of the different ingredients necessary for 20, 32, 40 and 48 ounce mixtures with different percentages of fat, sugar and protein and also the caloric value of the mixture, can be seen at a glance. The card is well printed, very compact and of such size that it can be carried in the pocket with ease.

As is necessary with all such devices, accuracy is often sacrificed for the sake of compactness. The absolute accuracy of some of the formulas is somewhat questionable. The fat content of the cream layer is considered 16 per cent., while the skim milk, (presumably that portion remaining after the removal of the cream) is supposed to be fat free. Such skim milk, however, always contains some fat and usually as much as 1 per cent.; therefore the actual fat content of some of the mixtures will be greater than indicated by the card. Whey is considered fat free without any statement of how the whey is derived. Although this is practically true of whey made from skim milk, yet when made from rich whole milk with thorough disintegration of the curd, whey may contain as much as 2 per cent. of fat.

Bearing its defects in mind, and with some preliminary knowledge of infant feeding, this device should be useful for the rapid calculation of milk formulas.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Pyrogenic Action of Lactose.—F. W. Schlutz (*Amer. Jour. Dis. Child.*, 1912, iii, 95) has made a study of the effect of lactose on the body temperature if introduced directly into the blood-stream in varying amounts and under varying conditions. The results of his experiments show that lactose given intravenously, subcutaneously or orally, possesses no distinct pyrogenic effect no matter in what concentration or amount it is given. It does possess a definite though not pronounced influence on the temperature if it is given subcutaneously or orally in an animal with a diseased intestinal tract in combination with a medium containing a sodium salt, such as physiologic or Ringer's salt solution. These results though definite are hardly so to the extent expected when one considers the pronounced effect produced clinically by the administration of lactose in similar conditions, and are far from explaining the pathogenesis of the fever occurring in alimentary intoxication.

Management of Squint in Children.—C. W. Le Fever (*Amer. Jour. Dis. Child.*, 1912, iii, 107) says that correction of hyperopia removes the chief cause of squint and that glasses should be fitted as soon as the child is seen, which is rarely before it is a year old. Atropin may be used to suppress the accommodation and render third nerve stimulus of no avail in helping the visual acuity, and the patient will soon cease the effort, incidentally ceasing to overstimulate convergence. This method, once much employed, should only be used when glasses are out of the question, and until such a time as the child may be glassed. It must be used in both eyes two or three times daily. All these little patients doubtless see double at first. As they learn that one object is false, and it perhaps leads them to make mistakes in taking hold of objects, they begin to ignore the dimmer one. This suppression soon becomes permanent. The squinting eye is now unable to see well even with its fellow covered, and is said to be amblyopic. Cure depends on the forced use of the squinting eye, by occlusion of the good eye, by a bandage worn permanently, for six weeks to two years, or better by a highly concave, neutral, frosted lens fitted closely over the good eye, while the proper correction is worn on the amblyopic eye. The cover should not be removed until the visual acuity is 20/30 or better. Both eyes are then glassed with the proper correction. The fusion sense must be reestablished by instruments based on the principle of stereoscopic vision. Operative measures are to be used only as a last resort and never until the correction has been worn at least one or two years.

Relation of Insects to Spread of Acute Epidemic Poliomyelitis.—C. T. Brues (*Infantile Paralysis in Mass. during 1910*, Boston: Wright and Potter Printing Co., 1912) states that nothing absolutely definite has hitherto been ascertained regarding the channels of infection of acute epidemic poliomyelitis. Many facts connected with the distribution of cases and the spread of epidemics of this disease, together with histories of insect bites, suggest at least that the disease may be insect-borne. From field work during the summer of 1911, together with a consideration of the epidemiology of the disease, it is suggested that *Stomoxys calcitrans* L., the ordinary biting stable fly, may be responsible for the spread of acute epidemic poliomyelitis. No facts which disprove such hypothesis have as yet been adduced.

Streptococcus Vaccines in Scarlet Fever Prophylaxis.—W. H. Walters (*Jour. A. M. A.*, 1912, lviii, 546) gives the following figures which are favorable to this treatment. In two years thirty-six nonimmune nurses went on duty in scarlet fever wards. Of these, twenty-one were vaccinated and one contracted the disease; fourteen were not vaccinated and four were attacked; one other received only one dose the day she went on duty and had contracted scarlet fever within twenty-four hours.

Cerebrospinal Fluid and Blood in Acute Poliomyelitis.—George Draper and F. W. Peabody (*Amer. Jour. Dis. Child.*, 1912, iii,

153) find that the spinal fluid from cases of acute poliomyelitis during the first few weeks after the onset of symptoms shows, in the great majority of instances, deviations from the normal. Fluids taken during the early days of the disease, and especially before the onset of paralysis, tend to show an increased cell count with a low or normal globulin content. At this early stage the polymorphonuclear cells amount to 90 per cent. of the total. Most fluids, however, show lymphocytes and large mononuclear cells almost exclusively. After the first two weeks the cell count usually drops to normal, or nearly to normal, and there is frequently an increase in the globulin content. A slight increase in globulin may persist for seven weeks or more. Analogous changes may be found in the spinal fluid of abortive cases. All fluids examined reduced Fehling's solution. The writers have found in the blood of patients with poliomyelitis a constant and marked leukocytosis. In several instances the count has been as high as 30,000. In only one case has there been a definite leukopenia. Besides the increase in total cells, there has been an equally constant increase of polymorphonuclears of 10 to 15 per cent. above the normal, and a diminution of lymphocytes of 15 to 20 per cent. The other forms of leukocytes have shown no abnormalities. Taken in connection with other available evidence, a leukocytosis of 15,000 to 30,000 is distinctly suggestive of acute poliomyelitis, especially if the polymorphonuclear cells are increased at the expense of the lymphocytes.

Malt Soup in Nutritional Disturbances of Infants.—J. M. Brady (*Jour. A. M. A.*, 1912, lviii, 751) says that milk nutritional disorder is a definite clinical condition occurring subsequently to the excessive administration of fat of cow's milk. It is frequently cured, particularly after the third month, by Keller's malt soup. Even if the metabolic disturbance has persisted so long that marasmus has developed, malt soup is often of signal service. For these babies to recover on malt soup they must have a high carbohydrate tolerance. Malt soup is frequently a good diet in diarrhea. Keller's malt soup is prepared as follows: Two ounces of wheat flour are mixed with eleven ounces of whole milk and then passed through a sieve. In a second vessel three ounces of extract of malt are mixed with twenty ounces of warm water. The two mixtures are then poured into a porcelain vessel, two and a half drams of 11 per cent. carbonate of potassium added, and the whole cooked with constant stirring for twenty minutes and then brought to a momentary boil; any loss through heat is made up by the addition of boiled water. This mixture has a formula of fat 1.20, protein 2.00, carbohydrates 12.00, and has a caloric value of 800 to the liter. The above is designed for babies with a body-weight of from six and a half to ten pounds from the third to the ninth month. For babies under three months old the flour is reduced to one ounce and the malt-extract to two ounces. It must be

kept on ice and warmed before being fed. It has a sweet pleasant taste and is taken greedily by all infants.

Administration of Serum in Epidemic Meningitis.—A. Sophian (*Jour. A. M. A.*, 1912, lviii, 843) believes the old method of administering serum is inaccurate and sometimes dangerous. He regards blood-pressure change as a very accurate guide to the quantity of serum that can be safely injected, frequently also indicating the quantity of cerebrospinal fluid that can be withdrawn. He regards a fall of blood-pressure of 10 mm. of mercury in adults or 5 mm. in children as an indication for stopping withdrawal, and one of 20 mm. during injection as a sign that this should be stopped. Rapid injection causes rapid fall of blood-pressure. The average dose of serum as controlled by blood-pressure is smaller than by the old method. Following an injection of serum, controlled by blood-pressure, the after-effects are usually much less severe. Mortality figures show unusually good results.

Edema in Infants.—P. A. Potter (*Arch. Pediatrics*, 1912, xxix, 204) has seen seventeen cases of dropsy in young infants, not of cardiac or renal origin, but in children suffering from extreme malnutrition and the great majority with an intercurrent diarrhea. A typical history is that a young baby with extreme malnutrition suddenly develops diarrhea. The diet is changed to boiled water, barley water or whey. After an interval of several days, during which the baby progressively loses weight, with the intestinal condition perhaps showing some improvement, but not enough to warrant any marked increase in the solid constituents of the diet, a gain of several ounces may be noted on successive days. The first sign of this condition is that the soles of the feet are red and rounded, instead of flat, and, if it has progressed for several days, the arch of the foot is lost. The redness may be noted even before the loss of normal contour. A certain proportion of the cases show no extension of the edema above the feet, and, if the baby lives, the swelling may gradually disappear with a corresponding loss of the suddenly gained weight. If, however, the edema continues and spreads, the next place where it may be noted is usually on the face, under the eyes. If the diet, low in fats and proteids, is continued, the edema spreads rapidly over the face and extremities. In many cases, babies, even those of from 4 to 5 pounds in weight, gain within two or three days from 1/2 to 1 pound, due entirely to the dropsy. In none of the seventeen instances, was there any involvement of the serous cavities. If the baby is still kept on a weak food, or on no food at all, the almost invariable and almost immediate outcome is death. The writer believes that the edema is an indication as to when increased feeding or resumption of prohibited elements is called for, especially of the proteids. Up to the time when the practice of resuming or increasing proteids in the diet was begun by him, nearly all the babies showing this condition died, and the symptom was considered an antemortem

sign. Since then the routine increase of the proteids in the diet has resulted in the recovery of a large and definite proportion of the cases showing edema and improvement in the general condition.

Low Percentages in Infant Feeding.—Protein, fat and sugar have been accused successively of being the chief source of trouble in artificial feeding and reduction of each or all of these constituents has been advised. R. D. Rudolf (*Can. Med. Assoc. Jour.*, 1912, ii, 173) thinks that starvation has been substituted for other possible dangers. He says that a marasmic infant, even if dieted ever so carefully may die, but if kept long enough on insufficient food he must do so. A healthy infant, who must be fed artificially, must get sufficient food to supply it with at least 100 to 120 calories per kilo of body weight per day. This equals about 1 pint of cow's milk for a child weighing 8 pounds. Much dilution of the food should be avoided, as the child must in this way take too bulky meals in order to keep up its nourishment. Such water as the child requires can more easily be given between meals. When it becomes necessary, on account of some digestive disturbance, or in fact any illness, to reduce a child's nourishment, this reduction should be receded from as soon as possible, as the patient cannot gain strength upon an insufficient diet.

Pertussis Vaccine as a Curative and Prophylactic Agent.—E. W. Saunders, W. Johnson, T. W. White and J. Zahorsky (*Pediatrics*, 1912, xxiv, 161) have used the vaccine prepared from Bordet's bacillus in forty cases of whooping cough. They observed no ill effects from its use and obtained benefit in all cases in which the cough was not of more than two or three weeks duration, and in some of longer standing. The improvement in number and severity of paroxysms was often evident in less than twenty-four hours, showing no evidence of a negative phase. The children treated varied in age from three months to eleven years, and in only a few cases was any other medication used. The writers have adopted the practice of giving the entire contents of one bulb furnished by the experimental department of Parke Davis & Co., so that in some cases regardless of age, the patient has received as much as 25,000,000 bacteria. This is repeated twice at intervals of one week. In addition to the cases mentioned above, it was used on fourteen children who had been exposed to the disease, but had not yet developed a cough. Most of these having been in the institution since early infancy it can be stated positively had not had pertussis. Some of the others in this group admitted at a more advanced age, may have had it but from the best obtainable history they had not. They received the usual three injections at intervals of seven to eight days and were in daily contact with well-developed cases. Of this group only one developed pertussis as evidenced by the typical paroxysm which extended over a period of only one week. Notwithstanding its brevity the leukocyte and differential

blood count prove it to be a true case of whooping cough. Seven others developed a cough of mild character while undergoing treatment. The cough was in no way characteristic of pertussis, and in no case lasted over two weeks. The writers recommend the pertussis vaccine as a prophylactic agent. While it is true that any infection will postpone or interrupt the course of pertussis, this agent alone will absolutely prevent it. The immunity is of uncertain duration, but the injections may be repeated, and it is of the utmost importance to postpone the disease until the first two years of life are past. The failures reported by other observers must be attributed to an impotent vaccine, or an insufficient dosage. As a remedial agent, success depends upon the promptness of administration, and the freedom of the patient from complications at the time. In no case should other treatment be withheld if indicated; especially in infants, who may be spared convulsions or bronchopneumonia by the use of emetics, sedatives and some member of the aromatic group. It is quite possible that much better results may be obtained in late cases by the use of larger doses. In view of the high mortality from pertussis in young children, there should be a systematic effort made to determine the duration of artificial immunity, and to keep them protected.

Trachoma.—After discussing the etiology and symptomatology of trachoma, L. W. Crigler (*Jour. A. M. A.*, 1912, lviii, 925) says that the two operations indicated in advanced cases of trachoma are, first, a removal of the tarsal cartilage of the upper lid, together with its overlying conjunctiva and retrotarsal fold; second, a removal of the tarsal cartilage of the upper lid, alone. The former procedure is indicated in the beginning cicatricial stage, where roughened and ulcerated follicles still remain; the latter, where the follicles have been replaced by connective tissue, and the cartilage, while still hypertrophied, is undergoing retrograde changes which result in a distortion of the lid. The operation of removing the cartilage and conjunctiva is termed combined excision, and is described as follows: The upper lid is doubly everted by means of fixation forceps and horn. A horizontal incision is made through conjunctiva alone at the junction of ocular and palpebral conjunctiva. The cut margin of the bulbar conjunctiva is slightly undermined, and three sutures are passed equidistant. The sutures are sufficiently long to admit of a needle at each end. The lid is now singly everted, and another incision 2.5 mm. from, and parallel to, the lid-margin is made through conjunctiva and cartilage. The ends of this incision are made to unite with the posterior one, and the conjunctiva and cartilage are gently dissected away, care being taken not to remove any of the tissues beneath the cartilage, and to leave a very thin strip of cartilage above, if possible, to prevent injury to the attachment of the levator muscle. Next, the three sutures placed in the bulbar conjunctiva are drawn forward, each being armed with two needles, and are passed from within

out, one end passing through the cut edge of the cartilage, the other just posterior. This causes coaptation of the bulbar conjunctiva with the 2.5 mm. strip of conjunctiva remaining; the fornix is obliterated. The sutures are tied over a wick of gauze, and the operation is completed. The diseased tissue has practically been removed, and thus we accomplish in half an hour what Nature takes years to do. The results in a hundred or more of these patients, operated on by members of the staff of the Manhattan Eye and Ear Hospital during the past two years, show at least 75 per cent. of cures. A resort to tarsal resection alone is less frequent, and the results, when the operation has not been done until late, less gratifying. The lid is everted, an incision through conjunctiva and cartilage is made 2.5 mm. from, and parallel to, the lid-margin, the cartilage is carefully dissected both anteriorly and posteriorly, removed, and the conjunctiva sutured in its original position, in a manner similar to that described in the preceding operation. Trachoma involving the lower lid does not lead to the bad results that are produced by the upper; where there is pronounced involvement, however, it acts as a source of constant irritation and retards recovery. Removal of the palpebral conjunctiva alone is here indicated, since the disease does not seem to involve deeper structures. The two lines of incision are similar to those in the upper lid, care being taken not to encroach on the bulbar conjunctiva behind, or through the tarsal cartilage in front. The conjunctiva is dissected away, and the raw surface is left to granulate and cicatrize. The cartilage being left in place, no deformity follows. Should granulations become too exuberant, they should be removed by scissors or cautery. In a few weeks the surface has become smooth.

Relation of Adenoids to Recurrent Vomiting.—Quoting various theories of the cause of recurrent vomiting, J. P. Sedgwick (*Amer. Jour. Dis. Child.*, 1912, iii, 209) states that of his series of twenty-two cases, twenty patients had adenoids or enlarged tonsils. Most of them had fever before or during the attacks. The posterior cervical glands were usually enlarged. A very common prodrome of the attacks was sore throat or nasal discharge. One "had bleeding nose at the times of the attacks." Chorea minor, rheumatism and endocarditis were complications in three cases. Geographical tongue and asthma were noted. The observation which led to the writer's presentation of the subject was the surprising result of removal of the adenoids in some of these cases, as shown by his report.

Dementia Precox in Childhood.—P. Haushalter (*Arch. de méd. des enf.*, March, 1912) tells us that while dementia precox is in general a condition of puberty or adolescence, it is rarely seen in infants. He distinguishes this condition from the dementia of general paralysis, or of epilepsy. There are three forms of dementia precox, simple, catatonic, and hebephrenic. In a case referred to by the author there was simple dementia, combined

with maladroitness, trembling, speech troubles, and exaggerated reflexes, in a child of eleven years. Two younger brothers had stigmata of heredo-syphilis. The autopsy showed changes such as are due not to general paresis, but to a toxic parenchymatous cerebropathy, similar to an encephalo-myelopathy. Such cases appearing before puberty show that this disease is not determined by that time of life. Pascal says that neither degeneration, nor heredity, are sufficient to cause dementia, but that there must be present a toxic condition, the poison having an elective affinity for the cortical neurons, and its nature at present unknown.

Mental Anorexia.—Buffet-Delmas (*Arch. de méd. des enf.*, March, 1912) calls by the name of mental anorexia a loss of appetite without any organic cause, which is found in children and is of hysterical nature. In children of sufficient age this condition can often be overcome by persuasion, seconded by threats of feeding with the stomach tube, and the use of gruels fed artificially. In young children the indication is to prevent inanition by artificial feeding.

Tracheo-bronchial Adenopathies.—F. Maillet (*Arch. de méd. des enf.*, March, 1912) says that the symptoms resulting from tracheo-bronchial adenopathy are generally due to some form of compression; they relate to the respiration, through the pneumogastric nerve, to the circulatory apparatus, or to the digestive apparatus, resulting from the cough acting reflexly to produce vomiting. These effects may be passing and due to pressure on the nerves alone, or may be true complications, due to aggravation, or extension of the lesions to other organs, or the entrance of new pathological factors into the situation. The first type of symptoms is found in simple adenopathies, the second type in tuberculous lesions of the glands. Crises of inspiratory dyspnea, accompanied by stridor and cyanosis may be seen. Sonorous cough and exaggerated dyspnea may occur only at night; asthmatic dyspnea may also be found in these cases. Pulmonary congestion due to changes in the vitality of the pulmonary organs is possible. Cyanosis, and hemorrhages into the meninges, and from the lungs and nose are due to compression of the venous trunks tributary to the vena cava superior. Adenopathy is seen after measles, grippe, and pertussis. Infection may enter as a cause of accidents; ulceration and perforation of a vessel by a process extending from an infected gland may occur.

Tuberculosis in Infancy and Childhood.—H. Koplik (*Johns Hopk. Hosp. Bull.*, April, 1912, 113) says that tuberculosis is a disease not only prevalent and widely so in infancy and childhood, but is peculiar to this age. Up to the second year of life, the incidence of active tuberculosis is less than at any other period. It increases from this time on and some authorities think that the time of greatest incidence of infections takes place at the fourth to the sixth year of life. The percentage of tuberculous children increases steadily up to the fourteenth year of

life. The course then takes a downward trend to adult life. The writer quotes the statistics of European autopsies and tuberculin tests showing that from 55 to 95 per cent. of children of the age of fourteen years are infected. In the United States the incidence is probably less on account of better sanitary conditions. In a great percentage of cases, infection can be traced to a person infected with tuberculosis who has been in the immediate vicinity of the infected child. Infection through tuberculous milk, that is, not milk containing human tuberculous matter, but milk from tuberculous cows, is rare. The course of the tuberculous process under the fifth year of life is acute and even in the pulmonary cases the duration of the illness is quite short as compared to the chronic course of the disease prevalent in the adult. In the nursing infant the symptoms are often obscure and become evident only in the terminal stage of the disease. A compilation of 209 hospital cases by the author shows them divided as follows: tuberculous meningitis, 158 cases; tuberculous pleurisy, 23; tuberculosis of the lungs, 17; of the peritoneum, 8; of other organs, 3. Of the 209, 75 per cent. were meningitic, though this is often, of course, a terminal manifestation of a focus of tuberculosis long dormant, as in cases of bone tuberculosis. Of the cases of meningitis 80 per cent. occurred in infants and children below the fifth year of life. Later in childhood the miliary form of tuberculosis is often difficult to differentiate from typhoid fever. A study of the writer's cases of tuberculosis of the lungs in infancy and childhood shows that here also the disease often runs an acute course. The physical signs at first simulate an ordinary bronchopneumonia. The temperature, however, is continuous past the period of an acute bronchopneumonia. The signs localized in most cases to the apices of the lungs on one or both sides, persist, fail to resolve, the emaciation, the failure of circulation (cyanosis) will raise suspicion at once of the tuberculous nature of the disease. If added to this there is a cough of a rasping, metallic nature and so-called expiratory dyspnea, our doubt develops into certainty. Many of the pulmonary cases show glandular involvement in the form of enlarged supra clavicular lymph nodes. Others show a stubborn diarrhea. The greatest interest centers in the question, what proportion of the cases of dry pleurisy and pleurisy with effusion in children who have not presented symptoms of previous pulmonary affection are tuberculous? In the author's hospital service, of forty-five pleurisies, twenty-three or 50 per cent. were manifestly tuberculous, sixteen were metapneumonic, seven occurred in subjects suffering from rheumatism and heart disease, and one in a nephritic. We may regard a pleurisy as tuberculous whose onset is not stormy though it may be acute or subacute, in which the temperature is not very high, 102°, 103° or even 104° F., in which the effusion is clear and absolutely free from organisms, in which there is a loss of flesh and strength and in which there is a history of tuberculosis in the vicinity of the patient, and in

which there is a positive result to the tuberculin tests, either of the skin or subcutaneously. The writer regards scrofulosis as a distinct clinical tuberculous entity, a form of infantile tuberculosis which develops on the foundation of a lymphatic constitution. The clinical picture of scrofulosis is quite characteristic: the glandular enlargements in the form of tuberculous adenitis, catarrhal states of the conjunctivæ, the nose and respiratory tract, the affections of the bones, spina ventosa, osteomyelitis of the long and flat bones, including those of the skull, manifestations on the skin in the form of lupoid eruptions, ecthyma, tuberculides and scrofulides, and all affections of the cornea and lens of the eye. Koplik utters the warning that in tuberculous pleurisy of children, in whom a von Pirquet test has been performed, and a positive result obtained, it is well not to try the subcutaneous method of diagnosis, for the confirmation of the local nature of the tuberculosis, unless we are prepared for a recrudescence of symptoms. The prognosis of tuberculosis in infancy and early childhood is bad on account of the tendency of the infection at this time to spread and become general. The older the child the better the prognosis. The best prognosis is beyond the age of seven years. The localized glandular and bone forms have a tendency to heal beyond this age limit. As regards prophylaxis, the future will lie very much in the direction pointed out by Grancher in France; the separation of infants and children from the vicinity of infection, if necessary from parents or *vice versa*.

Hemorrhagic Disease of the New-born.—O. M. Schloss and L. J. J. Commiskey (*Amer. Jour. Dis. Child.*, 1912, iii, 216) have investigated the coagulation of the blood in ten cases of the so-called hemorrhagic disease of the new-born, three of which they report. They find that the coagulation of the blood may be normal, delayed or absent. A deficiency or absence of thrombin or fibrinogen may give rise to imperfect blood coagulation and uncontrollable hemorrhage. In some cases of hemorrhage in the new-born in which blood coagulation is apparently normal, it seems probable that the hemorrhage is due to some localized vascular lesion or defect present only in the areas from which the bleeding occurs. The subcutaneous injection of whole blood is harmless and is of apparent value in the treatment of the hemorrhage.

Surgical Treatment of Intestinal Stasis in Children.—L. E. B. Ward (*Practitioner*, 1912, lxxxviii, 570) states that under certain conditions intestinal stasis, exactly comparable to that found in the adult, may occur in the child. Such stasis has a profound bearing on the course of certain diseases, *e.g.*, tuberculous joint disease, rheumatoid arthritis, and ulcerative colitis. Intestinal stasis can be effectually cured by ileocolostomy, and cure of the stasis is followed by relief of the child's symptoms local and general. He reports twelve cases treated for tuberculous disease of joints, one for rheumatoid arthritis, and one for ulcerative

colitis by the operation of ileocolostomy. In every case intestinal stasis with secondary autointoxication was shown to be present and it was for the stasis, which was believed to be the primary condition, that operation was undertaken. The clinical picture of intestinal toxemia in children is quite definite and easily recognized. Staining of the skin is one of the most constant signs, the degree depending somewhat on the natural coloring of the child. The skin has a dirty yellow-brown appearance, which is very marked in certain situations—notably the forehead, the eyelids, the lower part of the neck, the flanks, and the flexures of the limbs. The circulation is poor, the hands and feet being generally cold, blue, and clammy. The general attitude of the child is listless, dull, and apathetic. Often children are querulous and miserable in disposition. The appetite is poor, and they are thin and ill-nourished. In normal children a meal of bismuth leaves the body in about twenty-four hours. In tuberculous children, presenting the signs of autointoxication, bismuth may remain in some part of the large bowel from seventy to 160 hours. After ileocolostomy the bismuth reached the colon in four to nine hours and had passed from the body in twelve to twenty-four hours as in the normal child.

Backward and Defective Children.—The danger to the community of unrestrained procreation by the mentally defective is becoming more generally recognized. Citing many instances of the tendency of the feeble-minded to multiply either illegitimately or with legal sanction, I. T. Smart (*Arch. Pediatrics*, 1912, xxix, 268) says that the duty of the community is to gain personal information concerning the approximate number of aments in city, county, state; to endeavor to use present laws in so far as they cover the problem, and to seek to obtain further legislation which will more effectually deal with the needs in caring for these afflicted children; to demand that it shall be unlawful to issue a marriage permit to any person or persons who have at any time been declared to be mentally defective, or, when such evidence does not exist, and there is any doubt about the mental habits of either of the contracting parties, a certificate of mental fitness to be produced from a reputable physician in good standing. The importance of this subject depends upon the fact that there are over 7000 boys and girls in the schools of New York City who have definite mental defects.

CORRECTION.

In the paper on Empyema of Infancy in this Journal for May, page 898, the author, Dr. S. A. Blauner is erroneously put down Visiting Pediatrician to Lebanon Hospital. The correct title should read: Visiting Pediatrician to Har Moriah Hospital.

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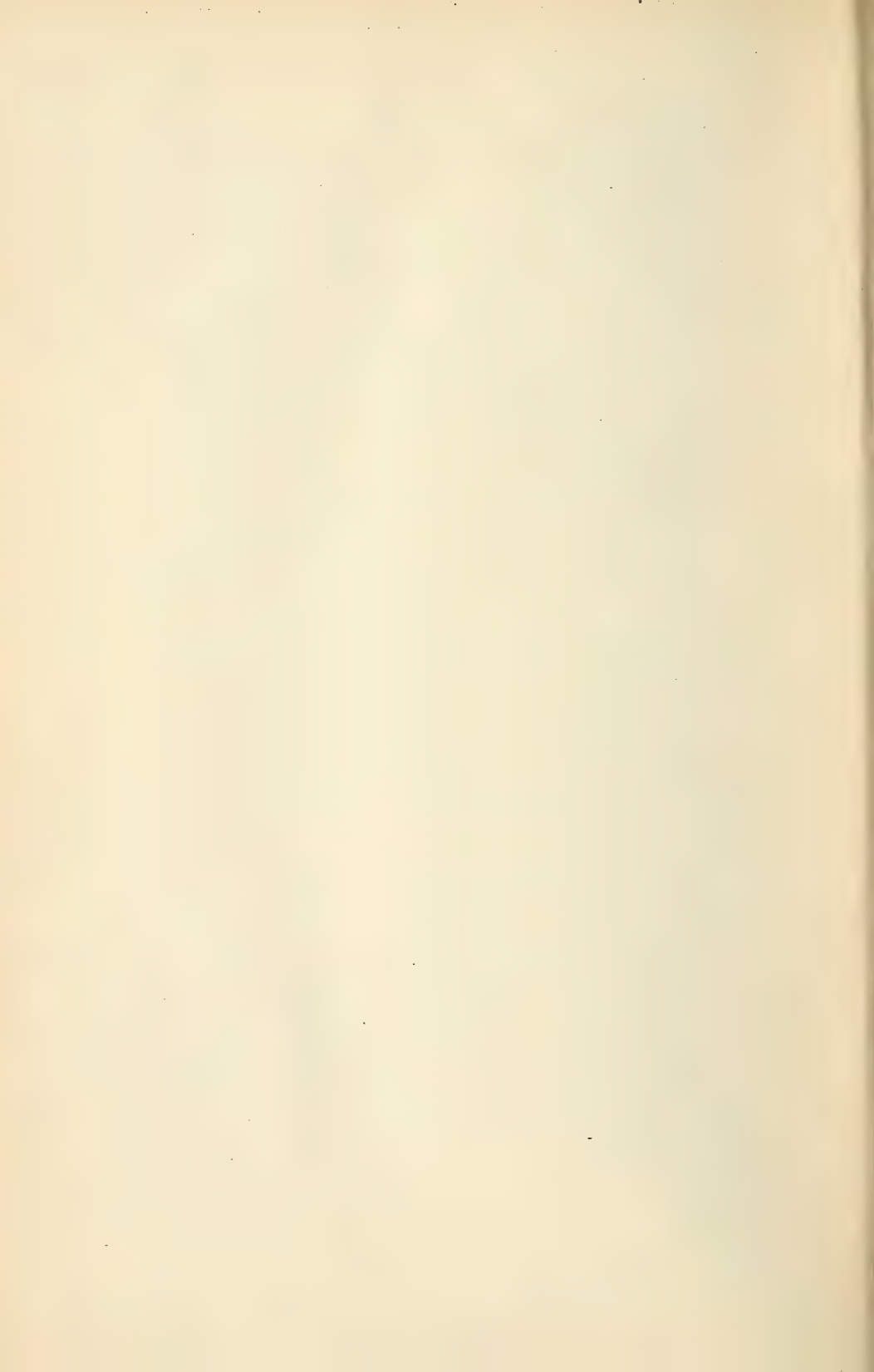
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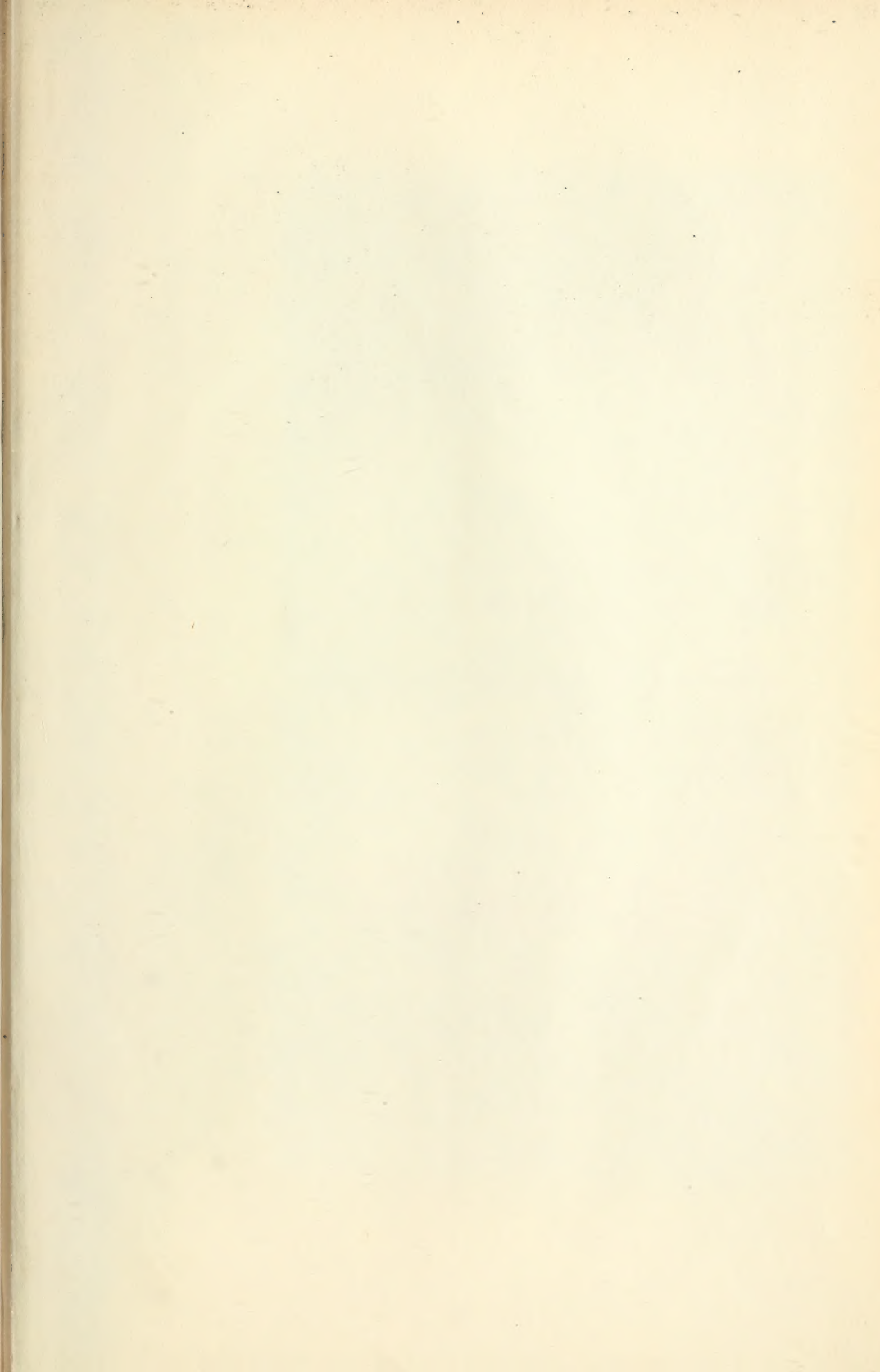
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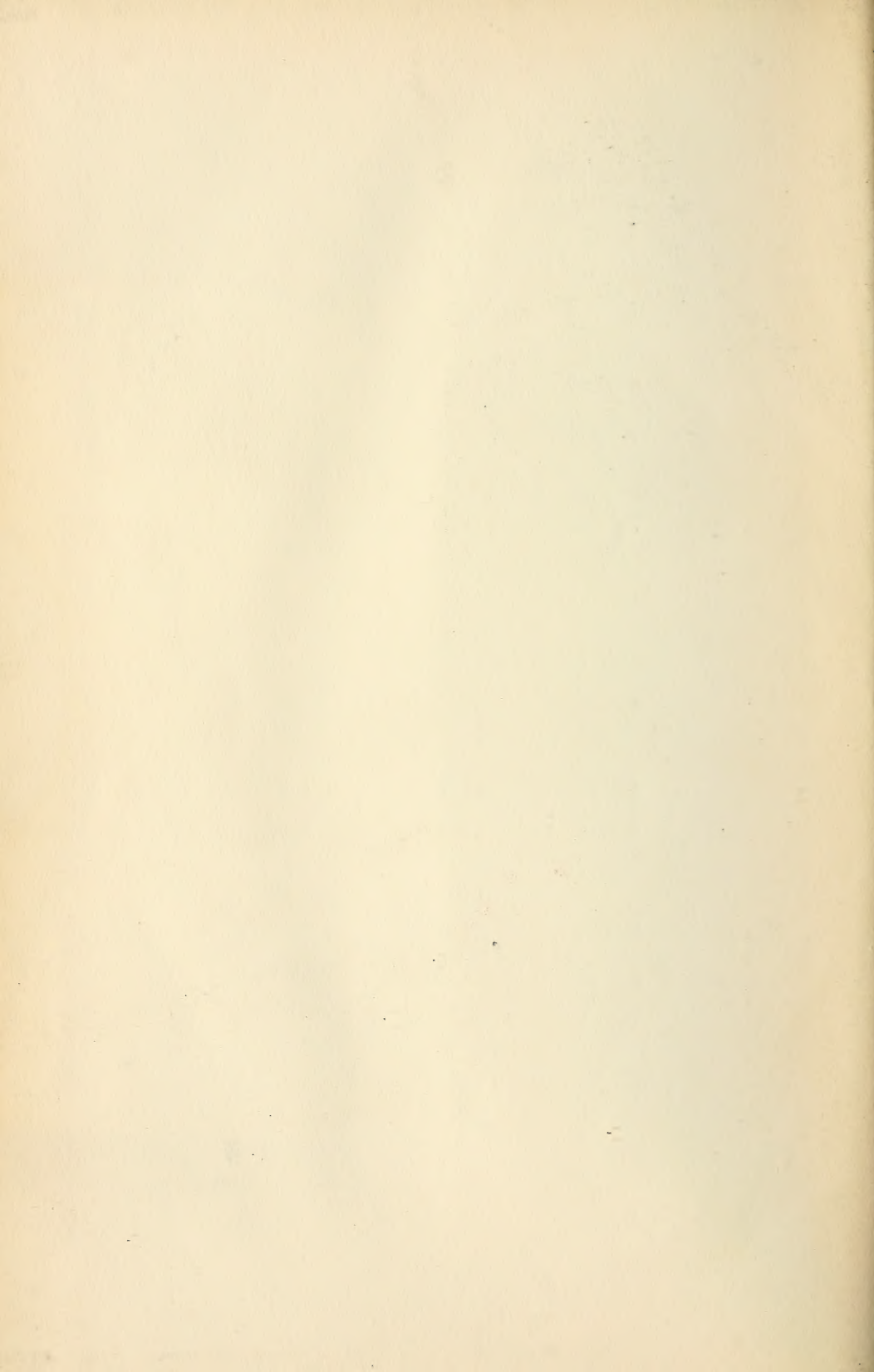
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